Telephony.

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THE PATH TO TRAVEL.

I love to weigh, to settle, to gravitate toward that which most strongly and rightfully attracts me, not hang by the beam of the scale and try to weigh less, not suppose a case, but take the case that is—to travel the only path I can, and that on which no power can resist me.—Thoreau.

Preparedness for Telephone Men.

The question of preparedness is one that is engrossing the minds of the American people just now. It is a vital issue, and has been discussed by the leaders of the several parties, the press devoting columns to it daily. While the nation is giving thought to this question, the men in the Independent telephone business, should also give it earnest consideration, applying it to their own industry.

The nature of the telephone business requires a preparedness at all times. Finances must be planned for a considerable time ahead, extensions and almost constant improvements must be provided for, the rulings of the commissions, both state and national, must be obeyed, and many other aspects of the business require preparation. This can only come through a knowledge of the business obtained through the exchange of ideas with fellow operators, the careful reading of the telephone press and following closely the helpful work of the state and national associations.

With the prospective combination of the two national associations, telephone problems of a national character will be more thoroughly worked out without so much division of opinion, and the new national body should have the support of all Independent telephone men. Many of our problems are approaching a solution and, with the proper support given to both state and national associations, this work will be made very much easier.

Telephone men have often been criticized for not being sufficiently interested in their business and making as careful a study of it as its importance demands. We should understand that we are engaged in a very important industry.

The telephone is a necessity. Its service is in constantly increasing demand, and it requires careful study and hard work to properly develop it. Of course the industry is comparatively young, the 1915 national convention marking its twenty-first milestone. Through its necessities, men have been drawn from every walk of life into a business which is not only technical but unlike most other lines. There was little of precedent to guide the early telephone pioneer. It was a case of live and learn. Today, however, the industry has settled down to a plain proposition of giving good service at a fair return on the money invested.

It is through co-operation and the exchanging of ideas that this result can best be brought about. In order to further strengthen the business and keep it on a secure foundation, Independent telephone men should help each other, support their state associations, and give full measure of support to the national organization which renders a service invaluable to the individual operating company and to the industry as a whole.

TELEPHONY strongly urges its Independent readers to join the national association and give it all the support necessary to carry on its work. Every Independent telephone man in charge of an operating property should attend the convention in Chicago on December 8, 9 and 10. It will be the most interesting and important meeting held in the last twenty years, and the program, published in our last week's issue, is of such practical value that it will well repay all for the time and trouble of attending. There should be more of a spirit of co-operation and helpfulness to the end that the telephone business, which ranks fourth among American industries, shall maintain its position, and so improve and extend telephone service that no man need be without this greatest of modern necessities.

Factors Tending Towards "The Revival of Business"

One of a Monthly Series of Articles Written with a View of Helping Readers to Think, by Supplying Fundamental Information Rather Than Conclusions—Reference to Conditions Prevailing a Year Ago Shows Developments of Last Year to be Remarkable

By Frank M. Huston, *Financial Editor, Chicago Evening Post—Editor, Rand McNally Bankers' Monthly*

As the year 1915 draws to a close, a brief comparison of conditions with twelve months ago is in order. The developments of the last year, so far as they relate to this country, are remarkable. Twelve months ago industry was practically at a standstill. We are just beginning to recover from the shock caused by the outbreak of the European war, a conflict unprecedented in history. Today America is crossing the threshold of a prosperous era. Her steel mills are operating at a capacity, which a few months ago was regarded as impossible and there are orders on the books sufficient to keep up this activity until the middle of the coming year.

In many other lines of trade business is slowly but steadily expanding. Naturally small business is not yet feeling to a *full measure* the impetus that is already manifesting itself in big business, but that is certain to come in a short while. It is impossible for such industrial activity as is now being experienced in the East and the Middle West among the big manufacturing establishments engaged in filling war orders, without the small retailer reaping some of the benefits. Already the retail trade in the Eastern section of this country is showing a remarkable revival, and as our crop production moves to the seaboard and into export trade, the West, too, will experience a revival in business that has not been equaled in many years.

To what extent the arrangements of very large credits, through which England and France and other European countries are able to buy liberally of our products, is responsible for this revival in business is difficult to say. No doubt it has been an important factor, especially in the steel industry.

It was essential that we extend credit to the European nations, who have been the leading customers of our manufacturers at a time when domestic business was at a standstill. This meant the distribution of a large amount of money in the purchase of raw materials and in the form of wages. In time these wages find their way into the retail store. As the manufacture of products proceeds and they are ready for delivery, the transportation lines feel the revival in traffic. That is now being experienced. An illustration of this is found in the railway earnings statements of many of the Eastern lines—the Pennsylvania showing the largest October traffic in its history, the New York Central making new records and so on through the East and Middle West.

The pressure of these war orders for early delivery has so congested our steel mills and is congesting our railroads to the extent that the mills cannot fill domestic requirements unless the orders are placed early so as to insure delivery when the materials are needed. Thus, this foreign business has stimulated our domestic business, with the result that we hear of increased activity in all branches of trade.

There has been no business so backward since the war begun as the lumber trade. Even this is now showing a revival that promises much in the near future. The more general the business activity of a country, and the wider the distribution of wages, the more prosperous will be the people of that country. Labor today is better employed than it has been at any time in a number of years and in many sections skilled labor is exceedingly scarce.

One of the most reassuring features of the situation is the abundance of capital and money. Notwithstanding this increased activity in the industrial world, especially in the East, there is an excess of money and this in face of the fact that we have extended to France and England credit, in the shape of a short time loan, to the amount of $500,000,000 or the equivalent of about one-fourth of the amount that annually goes into new securities. When that loan was negotiated, there was considerable apprehension lest we would so deplete our capital supplies as to hamper the financing of our own business enterprises. As a matter of fact, what we loaned to Europe was credit. To put it in other terms, we have loaned to Europe our surplus commodities, taking its obligations to pay for them to the extent of a half billion dollars within five years, exacting in return for this credit, 5½ per cent. interest.

This credit is available as a banking asset in this country. We find that our capital supplies have been increased instead of decreased, as many expected, for the use of this credit has enabled us, through the employment of our factories, mills, labor and raw materials, to create a considerable volume of new wealth, which otherwise would be lying dormant.

The American people are taking advantage of a golden opportunity, with a courage and confidence that promises the development of a period of great prosperity, which should continue if undue inflation can be avoided, for a number of years.

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Independent Telephony's 21st Birthday

December 8, 9 and 10 the two national Independent telephone associations unite in celebrating the twenty-first birthday of Independent telephony.

Every Independent telephone manager and every manufacturer of Independent telephone apparatus and equipment has been invited to the birthday anniversary.

Twenty-one years ago Independent telephony was an infant, hardly able to crawl. Today, it is a powerful industry, 4,000,000 stations strong—the most marvelous growth ever recorded by any industry.

It is therefore most fitting that there be a great gathering in Chicago at which the progress of the industry can be reviewed, from its birth to its attainment of a wonderful position in the nation's life. At this gathering will be many men who anxiously watched over the infant, who nursed it through its developing years and who now proudly point to their child, which is fulfilling their imagination's greatest desires.

There will be present men who but lately have come into the Independent telephone family, anxious now to acclaim the worth of those responsible for the bringing of the industry through adversities and triumphs to victory. It has not been one man's work—it has been accomplished by the loyalty and constant effort of the thousands of men and women in the fifteen thousand exchanges and the dozens of factories that together supply the most intimate service rendered the public.

A mere announcement of the convention program with its necessary discussions of the engineering, accounting, and commercial problems, conveys no real idea of the tone of the rejoicing over a great achievement that will pervade every discussion and which, at the banquet, will reach its most enthusiastic pitch.

A great convention is to be held? Yes. But greater than that will be the celebration of the coming of age of Independent telephony. The addresses made and the discussions which follow will be printed and distributed, doubtless. But to realize the importance of the occasion, to gain inspiration for redoubled efforts, to be filled with pride for being a part of such an industry—it will be necessary to be present to hear, to see, to feel.

No one, no matter what his position, should miss this great opportunity—this celebration.

This anniversary marks the coming of age and the beginning of the man's work—the steady progression along lines now laid down—to supply to every man in every city, on every farm, telephone service constantly efficient.

An opportunity presents itself. Will you be there to embrace it?

A Greater Public Interest

Equa Treatment for Common Producers, Common Carriers and Common Consumers—Results of Some Practical Tests of the Average Man's Interest, Information and Attitude Relative to Utilities—Imaginary and Real Facts—Concluding Installment

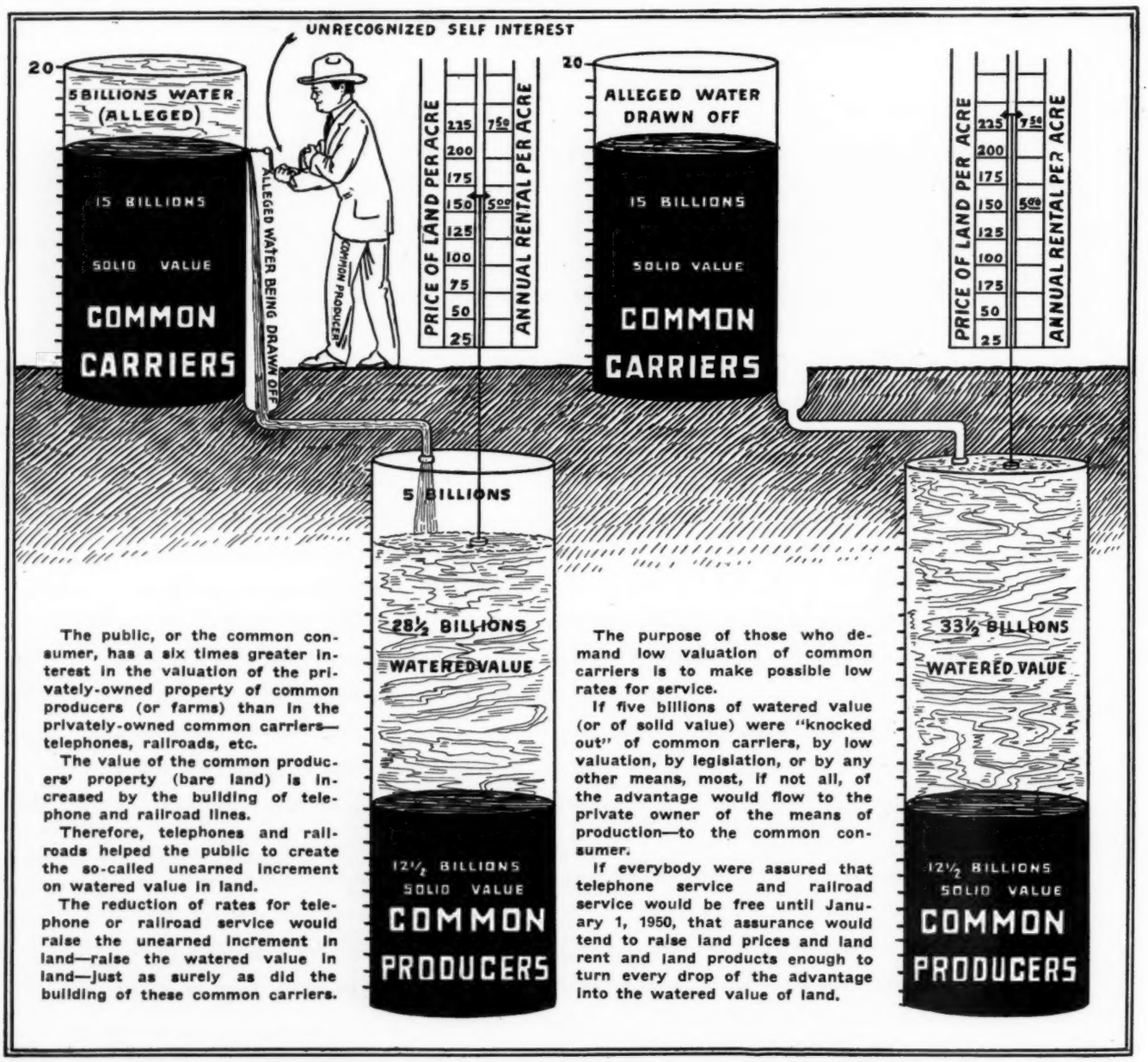
By James H. Shoemaker

One telephone man decided to make some practical tests of the average man's interest in, information about and attitude toward certain matters which vitally affect the pocketbook nerves of the owners of utilities. On four different occasions, the same questions were put to men of more than average ability.

The first group was composed of 25 men who were at an evening gathering for the annual election of officers of an organization to which they all belonged. Among these men were physicians, merchants, traveling salesmen, bankers, etc. The second group contained an equal number. It was composed of students of the senior class of a college. The third was comprised of about 20 college professors; and, the fourth was a group of wide-awake telephone managers.

In each of these four instances, the test was made in substantially the same manner. The telephone man began by enumerating the terms in which he would speak of certain departments of industry, business, etc., as follows:

(1) "Mr. Common Producer" means the private owner of the farms on which food and the other "necessities" are produced. And, "Mr. Farmer" means Common Producer's hired man or tenant. (2) "Mr. Common Carrier" means the railroad and telephone which supply service between Mr. Common Producer and Mr. Common Consumer.


UNRECOGNIZED SELF INTEREST
20
5 BILLIONS WATER (ALLEGED)
15 BILLIONS
SOLID VALUE
COMMON CARRIERS
ALLEGED WATER BEING DRAWN OFF
COMMON PRODUCER
PRICE OF LAND PER ACRE
225
200
175
150
125
100
75
50
25
ANNUAL RENTAL PER ACRE
7.50
5.00
5 BILLIONS
28½ BILLIONS
WATERED VALUE
12½ BILLIONS
SOLID VALUE
COMMON PRODUCERS
20
ALLEGED WATER DRAWN OFF
15 BILLIONS
SOLID VALUE
COMMON CARRIERS
PRICE OF LAND PER ACRE
225
200
175
150
125
100
175
50
25
ANNUAL RENTAL PER ACRE
7.50
5.00
33½ BILLIONS
WATERED VALUE
12½ BILLIONS
SOLID VALUE
COMMON PRODUCERS
The public, or the common consumer, has a six times greater interest in the valuation of the privately-owned property of common producers (or farms) than in the privately-owned common carriers—telephones, railroads, etc.
The value of the common producers' property (bare land) is increased by the building of telephone and railroad lines.
Therefore, telephones and railroads helped the public to create the so-called unearned increment on watered value in land.
The reduction of rates for telephone or railroad service would raise the unearned increment in land—raise the watered value in land—just as surely as did the building of these common carriers.
The purpose of those who demand low valuation of common carriers is to make possible low rates for service.
If five billions of watered value (or of solid value) were "knocked out" of common carriers, by low valuation, by legislation, or by any other means, most, if not all, of the advantage would flow to the private owner of the means of production—to the common consumer.
If everybody were assured that telephone service and railroad service would be free until January 1, 1950, that assurance would tend to raise land prices and land rent and land products enough to turn every drop of the advantage into the watered value of land.

A Greater Public Interest.

(Copyright, 1915, by The Goodwill Fellowship.)

(3) "Mr. Common Consumer" means everybody who must get food from the land. To be more specific, Mr. Common Consumer will personify Jones, Smith or Brown, who has just paid his bill at the meat market. This was a bill for 100 pounds of beef at an average price of 18 cents, or a total of $18.

Now, without consulting each other, and without getting any information from any source, please place on the table, on a piece of paper, one figure showing what part of Mr. Common Consumer's $18 goes to Mr. Common Carrier for hauling Mr. Common Producer's steer from a nearby town to Chicago and the dressed beef back from Chicago to this place, and, another figure showing what part of the Mr. Common Carrier's total pay goes as a return or dividend on watered value or "watered stock." Make both figures according to your own intuition concerning these two matters.

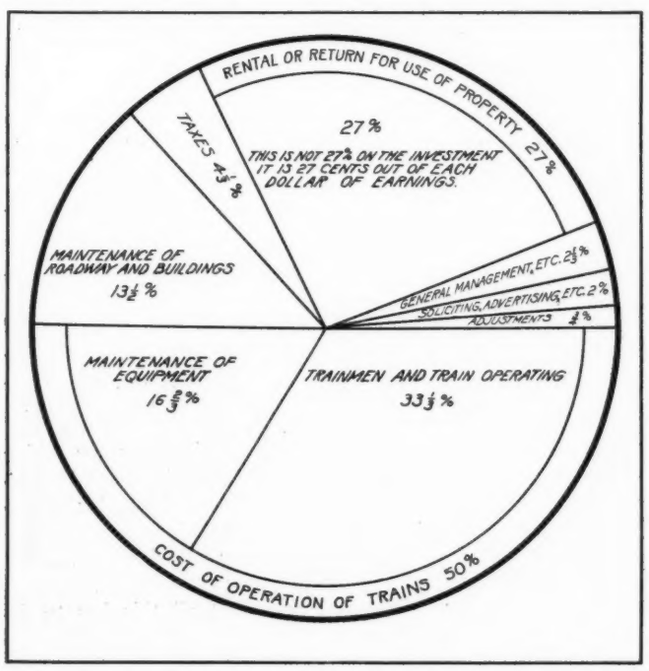
Among the telephone men were four whose actual experience had taught them the facts. Their guesses had to be excluded. With the figures of those four cast out, the average, for the four groups of approximately 100 guessers, was $4.76 as the total paid to the railroad, and one-half of that amount, or $2.38, as the amount passing from Mr. Common Consumer to pay returns on unearned railroad values or watered stock.

The rate for residence telephones in the town where two of these tests were made, is $1.50 a month, $18 a year. That is why the meat bill was placed at the same theoretical figure. The issue was placed, by the telephone man, upon the basis of a railroad charge for various reasons, among which were the following:

(1) It enabled a principle to be dealt with in a manner wholly impersonal to the telephone man.

(2) There was no such broad basis available for the apportionment of the various parts of the "telephone dollar." The Interstate Commerce Commission's totals for all the railroads, for the last fiscal year was used, therefore, for the apportionment of the various parts of the "railroad dollar."

(3) It was confidently expected that in the "home town," at least, when the interest had partly subsided, the men of each group would finally ask how much of the total telephone income is used for dividends on watered stock.


RENTAL OR RETURN FOR USE OF PROPERTY 27%
27%
THIS IS NOT 27% ON THE INVESTMENT IT IS 27 CENTS OUT OF EACH DOLLAR OF EARNINGS.
TAXES 4½%
MAINTENANCE OF ROADWAY AND BUILDINGS 13½%
GENERAL MANAGEMENT, ETC. 2⅔%
SOLICITING, ADVERTISING, ETC. 2%
ADJUSTMENTS ⅔%
MAINTENANCE OF EQUIPMENT 16⅔%
TRAINMEN AND TRAIN OPERATING 33⅓%
COST OF OPERATION OF TRAINS 50%

Expenditure of Average Dollar Earned by All the Railroads.

In each case it turned out as expected. And an opportunity arose for the telephone manager to exhibit the figures from his own records "by request."

At each of these four tests, as soon as the averages of all the guesses had been determined, every one present was given a type-written sheet containing the following:

Distribution of the average dollar received by all the railroads of the United States for year ending June 30, 1914.	
Wages and other expenses, train operation	$0.333238
Wages and other expenses, upkeep of equipment	.168539
Wages and other expenses, road and bldgs	.134456
Taxes	.043311
Management (general)	.023026
Soliciting (traffic) and advertising	.019282
Adjustments	.007750
	$0.729602
For use of the property of the road	.270398
	$1.000000

Then it was shown, by the use of actual freight bills, that the rate on live cattle to Chicago was 22 cents a hundred, and on dressed beef, returning, 20 cents per hundred. It was stated, also, that 166 pounds would have to be allowed, as beef "on hoof," to provide for 100 pounds of dressed beef for the return shipment; and, that this meant a total charge of 36½ cents for the haul to Chicago, which, with the 20 cents for the return of the dressed meat, made 56½ cents, instead of $4.76 as had been guessed.

The question then came up, as to what part of that 56½ cents could possibly have been used as return or dividends on watered stock. For making that point clear, another typewritten sheet was presented showing the following:

Apportionment of Mr. Common Carrier's 56½ Cents.	
For wages and expenses of train operation	$0.189
For wages and expenses of upkeep of equipment	.096
For wages and expenses upkeep of road and bldgs	.076
Taxes	.024
Management (general)	.014
Soliciting (traffic) and advertising	.011
Adjustments	.000
Total paid out by Mr. Common Carrier	$0.41
Balance available as pay for use of property	.15½
	$0.56½

Attention was next called to this point: Out of a total of 20 billions of capitalization, five billions, or one-fourth is the most that the railroads have been accused of having in the form of watered stock. And, one-fourth of the profit of 15½ cents is only 3⅞ cents, which is the most that could have gone for watered stock if the worst accusation had been shown to be true.

In three of the tests, certain guesses were made as high as $10.80 for the amount of freight charged in an $18 meat bill. One telephone man guessed that the freight charge would be $7.20. A number of college students and college professors guessed above $6 and not one of them guessed below $3.

Before allowing the interest to lag, concerning the people's erroneous opinions as to the proportion of their cost of living which goes for dividends on watered stock, another typewritten memorandum was given out as follows:

Is This Worthy of a Fair Man's Interest?

The railroads have been accused of having watered stock, social value or unearned increment in their properties, to the amount of five billions, out of a total of 20 billions. If all that has been accused were absolutely proven, it would be one-fourth unearned value to three-fourths earned value.

Let us now analyze this same $18 meat bill from the standpoint of Mr. Common Consumer's interest in Mr. Common Producer. In the case of Mr. Common Producer, the latest available United States Census Report gives the government's figure for the unearned increment, or the social value, in the sum total of Mr. Common Consumer's farms as $28,475,647,169.

The government's figure for the buildings, implements and live stock is $12,515,774,821. Therefore Mr. Common Pro-

ducer's property is almost three-fourths unearned increment and only one-fourth improvements or earned value.

It will be said, of course, that the work of Mr. Common Producer's tenant or hired man helped to create the so-called unearned value in the farms. That contention will have to be admitted. But it will have to be admitted, also, that the workmen of Mr. Common Carrier helped to create the site value or unearned increment, both in the farms and the properties of the common carriers. In other words, if the rails and the wires, which are used for transportation and communication, were to be pulled out into the ocean some dark night, the 28½ billions of unearned value in farms would shrink fully as much as the value of common carriers would shrink if the farmers were all to run away to some other continent.

Let us now compare the returns received by Mr. Common Producer from Mr. Common Consumer's $18 meat bill, with the returns received therefrom by Mr. Common Carrier from the same bill:

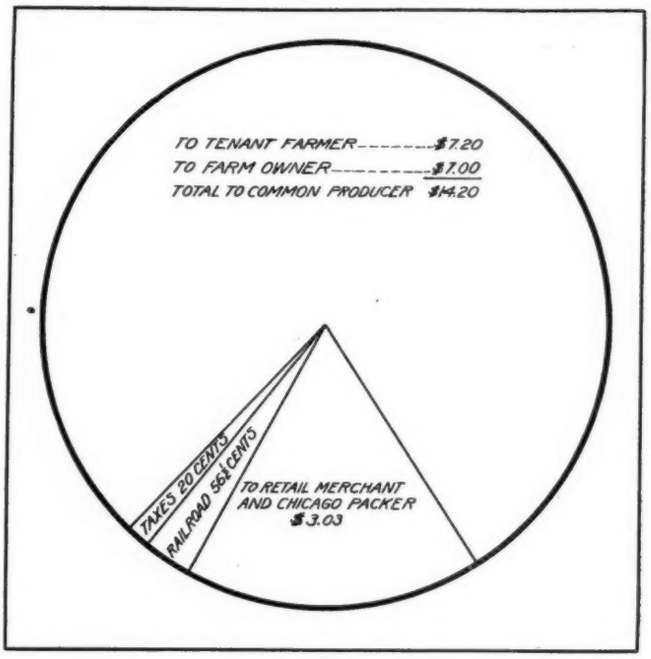
Amount collected by Mr. Common Producer for 155½ pounds of live beef at the average of the prices quoted November 9, 1915, for "good to choice" steers, which was $9.50		$14.765
Deduct amount paid to Mr. Common Carrier		.565
Amount realized by Mr. Common Producer		$14.20
From the amount realized by Mr. Common Producer, which was		$14.20
Deduct the one-half which the average farm-owner allows to his tenant, in this locality		7.20
Net amount realized by Mr. Common Producer, out of Mr. Common Consumer's $18 meat bill as return or dividends on the watered value of unearned increment in his land		$ 7.00
From the amount paid to Mr. Farmer which is		$ 7.20
Deduct the proportion which he will have to pay out as taxes		.20
Net amount realized by tenant farmer		$ 7.00

Mr. Consumer's meat bill now appears in the following form:

Amount paid to Mr. Farmer for working to produce meat		$ 7.20
Amount paid to Mr. Common Producer for use of unearned increment		7.00
Amount paid to public treasury as taxes		.20
Amount paid to Mr. Common Carrier (operating expense)	$0.39	
Amount paid to Mr. Common Carrier (undisputed return)	.13⅛	
Amount paid to Mr. Common Carrier (disputed return)	.04⅜	
		.565
Total		$14.97
Balance available for the work of the packers in Chicago, for the bad accounts, rent, clerk and delivery hire, light, heat, advertising and miscellaneous expenses of the meat market merchant, together with any and all profits to which each may be reasonably entitled		3.03
		$18.00

Mr. Common Consumer (who is everybody or the public) pays		$18.00
And thinks $2.38 goes for cost and $2.38 for watered stock of Mr. Common Carrier, because Mr. Common Carrier has hauled the live steer and the dressed meat so far. But, Mr. Common Carrier gets for operation	.39	
Undisputed profit	.13⅛	
Disputed profit	.04⅜	.56½
Mr. Farmer (the workman) gets		7.20
Mr. Packer and Mr. Retailer, combined get		3.03
Mr. Tax Treasurer gets		.20
Mr. Common Producer gets for the use of unearned value		7.00
		$18.00

In each instance an effort was made to explain, to the satisfaction of everybody, the reason why the average guess was $2.38, as the amount going toward watered stock, when, in fact, less than five cents could, by any possibility, be so used.


TO TENANT FARMER $7.20
TO FARM OWNER $7.00
TOTAL TO COMMON PRODUCER $14.20
TAXES 20 CENTS
RAILROAD 56½ CENTS
TO RETAIL MERCHANT AND CHICAGO PACKER $3.03

Real Distribution of "Common Consumer's $18 Meat Bill."

And in making that explanation the following leading editorial from a metropolitan daily newspaper was read:

'WAY UP LESSON IN ECONOMICS.

Children of the upper grade, upper class, will please stand up and absorb a very simple but not too familiar lesson:

Let *A* equal the farmer who has raised one hog.
Let *B* equal the middleman, who buys *A's* hog.
Let *C* equal the railroad that transports the hog.
Let *D* equal the meat market proprietor who sells meat.
Let *E* equal the ultimate consumer.

Says *B* to *A:* "I'll give two dollars for your hog. I gave you three dollars for a hog last year, but transportation is higher this year."

Says the retail meat merchant to the ultimate consumer: "Pork costs you forty cents a pound this year instead of thirty cents; transportation costs more this year."

Says the railroad to the public: "The Interstate Commerce Commission allows us to raise rates. The producer getting less and the consumer paying more, we will now enter upon an era of unprecedented prosperity."

The class will now take its slates and figure out where *A* (the farmer) and *E* (the consumer) will get off, under the theorem that the higher the rates, the higher the prosperity.

The telephone man exhibited the printed page upon which the foregoing actually appeared. He suggested that as long as editors of city papers flattered and encouraged popular errors and prejudicies in that fashion, it is no wonder that the average man guesses 90-fold too much when asked what returns he is paying on watered stocks of common carriers.

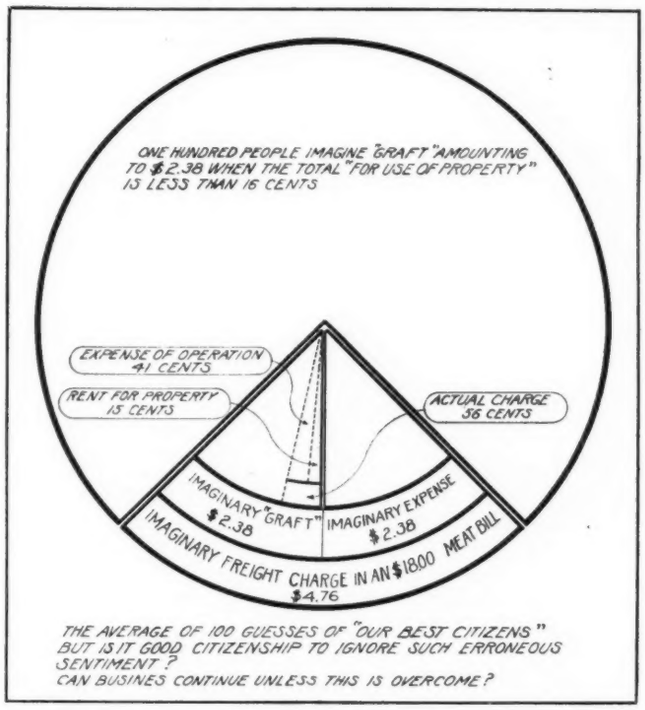
But someone is wanting to know what all this has to do with the interests of telephone men:

In the first place, all common carriers look alike to Mr. Common Consumer. If Mr. Telephone Man will inquire he will discover that Mr. Common Consumer is just about as far wrong in his guess as to what becomes of the $18 which he pays each year for his residence telephone, as he has been shown to be wrong about the railroads.

In the second place, as has already been indicated, telephone men, themselves, are just as far wrong as other persons in their guesses about this railroad matter. And, unless telephone men will take time to be fair about the railroads, even

in their intuitions or guesses, how can they expect people who are not engaged in the common carrier business to take time to find out the truth, or, to be fair in their unconscious attitude toward telephone affairs?

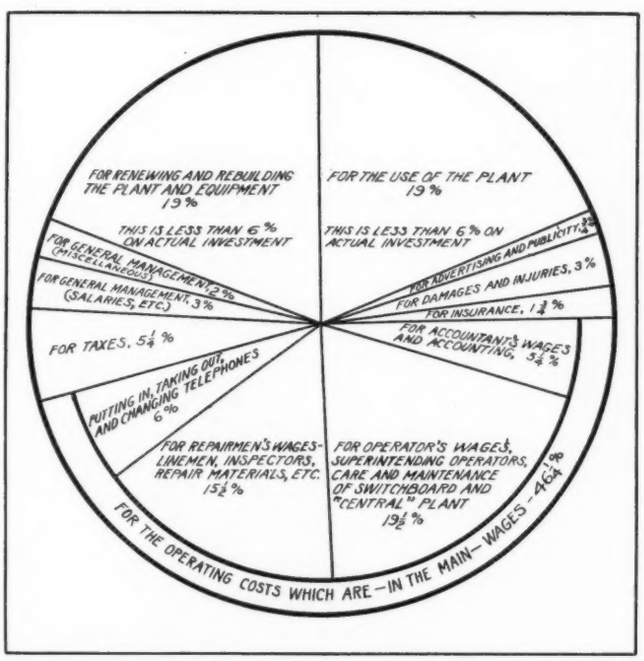
But, in the third place, the meat bill and the railroad were


ONE HUNDRED PEOPLE IMAGINE "GRAFT" AMOUNTING TO $2.38 WHEN THE TOTAL "FOR USE OF PROPERTY" IS LESS THAN 16 CENTS
EXPENSE OF OPERATION 41 CENTS
RENT FOR PROPERTY 15 CENTS
ACTUAL CHARGE 56 CENTS
IMAGINARY "GRAFT" $2.38
IMAGINARY EXPENSE $2.38
IMAGINARY FREIGHT CHARGE IN AN $1800 MEAT BILL $4.76
THE AVERAGE OF 100 GUESSES OF "OUR BEST CITIZENS"
BUT IS IT GOOD CITIZENSHIP TO IGNORE SUCH ERRONEOUS SENTIMENT?
CAN BUSINES CONTINUE UNLESS THIS IS OVERCOME?

Estimated Graft in Railroad Business and Actual Facts.

used as an indirect and impersonal method for bringing before the leaders of thought in that locality, these three facts:

First. That Mr. Common Consumer's $18 meat bill carries with it an officially declared public interest amounting to $7—


FOR RENEWING AND REBUILDING THE PLANT AND EQUIPMENT 19%
FOR THE USE OF THE PLANT 19%
THIS IS LESS THAN 6% ON ACTUAL INVESTMENT
THIS IS LESS THAN 6% ON ACTUAL INVESTMENT
FOR GENERAL MANAGEMENT (MISCELLANEOUS) 2%
FOR GENERAL MANAGEMENT (SALARIES, ETC.) 3%
FOR ADVERTISING AND PUBLICITY, 3/4%
FOR DAMAGES AND INJURIES, 3%
FOR INSURANCE, 1 3/4%
FOR TAXES, 5 1/4%
FOR ACCOUNTANTS' WAGES AND ACCOUNTING, 5 1/4%
PUTTING IN, TAKING OUT, AND CHANGING TELEPHONES 6%
FOR REPAIRMEN'S WAGES-LINEMEN, INSPECTORS, REPAIR MATERIALS, ETC. 15 1/2%
FOR OPERATOR'S WAGES, SUPERINTENDING OPERATORS, CARE AND MAINTENANCE OF SWITCHBOARD AND "CENTRAL" PLANT 19 1/2%
FOR THE OPERATING COSTS WHICH ARE—IN THE MAIN—WAGES—46 1/4%

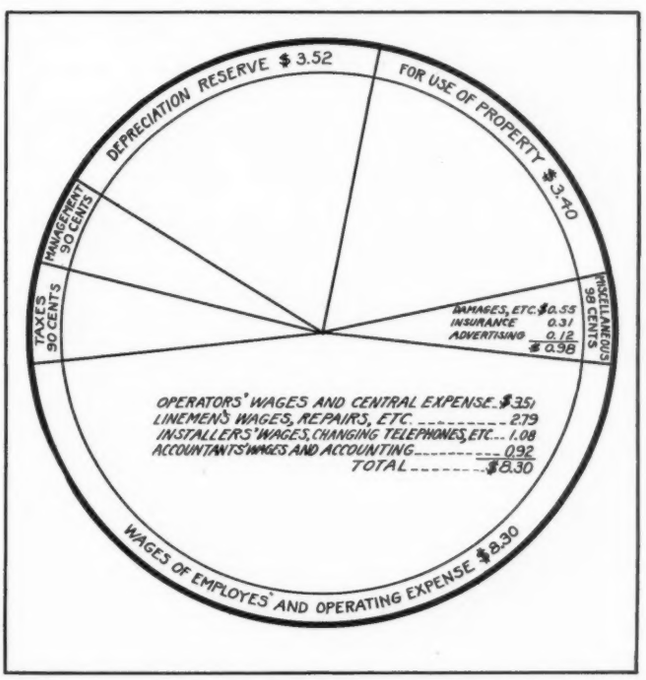
Purposes for Which One Telephone Company Spends Each Dollar.

a seven-dollar public interest in Mr. Common Producer's unearned increment, as against less than five cents of a disputed public interest in Mr. Common Carrier's unearned increment.

Second. That there is no watered stock in the telephone company's capitalization to which Mr. Common Consumer pays $18 yearly; but that if there were the same proportion of watered stock as has been charged against the railroads, each dollar paid to the telephone company would be divided up, approximately as follows:

For wages of telephone operators	$0.15962	
For superintending operators	.00651	
For wages and other switchboard and "central" expense	.02941	$0.19554
For depreciation—a fund set aside to be paid out for wages and material for upkeep of plant and equipment—about 6 per cent		.18976
For wages, material, etc. (operating repairs)		.15572
For wages, etc., putting in, taking out and changing telephones		.05821
For taxes		.05231
For wages of accountants and bookkeepers and stationery		.05204
For general management (salaries and expenses)	$0.03124	
For other general expenses	.02012	
		.05136
Damages (personal injuries, etc.)		.03110
Insurance		.01741
Advertising and general publicity		.00641
Total, for upkeep, taxes and operation		$0.80986
Added to surplus (*not* depreciation reserve)	$0.01179	
Paid, as dividends (about 5.3 per cent.)	.17835	.19014
		$1.00

If, for the sake of argument, it were conceded that there is one-fourth watered stock, even then the amount of each dollar



How $18 Received Annually from a Residence Telephone is Spent.

going for that purpose would be less than six cents, or, about $1 out of $18—*but there is no watered stock; and, 5.3 per cent. is not too high a return.*

The third reason for using the railroad for the tests was this: Since telephones have been declared common carriers, and, more especially since they are being valued at the same time and by the same commission as the railroads, the two are more than ever before, "in the same boat." If the advocates of the "Historical method" of valuation were to win out, or if those who oppose allowance for plant which has been paid for out of earnings were to win out while the railroads are being valued, *how could telephone owners expect to get any allowance for the earnings which they had reinvested in plant?*

But the main reason for the presentation of the foregoing points in this manner is this:

In each of about 1,500 localities there is a telephone man who, to the fullest limit of his ability, is as thoroughly interested in and active about the public prejudice against common carriers as is the ablest railroad president in the whole United States. And, if he has held his job for twelve or fifteen years, he has done these two things:

First. He has led the sentiment of the people and kept their good will.

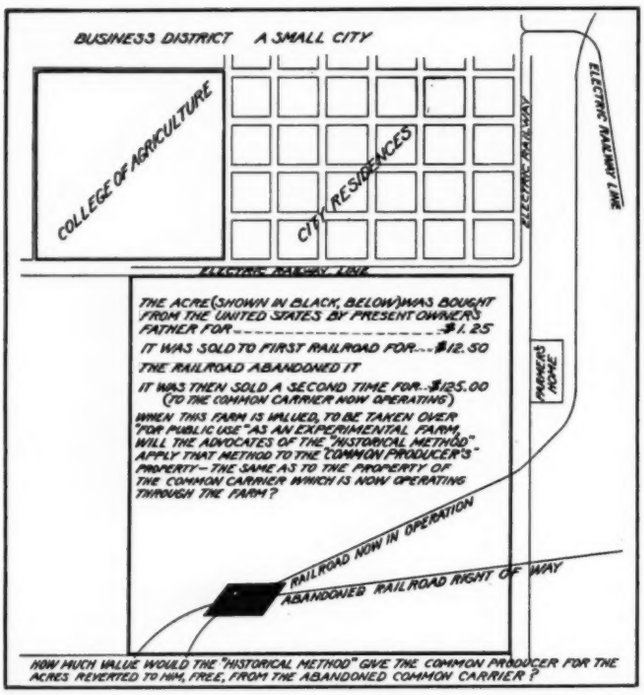
Second. He has "made it pay."

If he had failed in the first of the two, his plant might have continued in use, *but he would have been compelled to engage in some other venture.* If he had failed in the other, *both he and his company would have been put out of the business.*

"The 'telephone man' of each local company will some day be relied upon by the responsible heads of all the other utilities. For, whether he knows it or not, the man who succeeds in keeping himself for ten or fifteen years at the head of a telephone undertaking is a *statesman and a business man combined.*

Some day he will be the grain of leaven which leavens each community with a kindlier feeling between the servant and the served. He will be appreciated for his real worth. He will be recognized as the community tuning fork—the instrument which registers concert pitch—and all things will be attuned to his higher standards of serviceableness and good will.

The telephone business will be the first department of human endeavor to square itself with personal liberty, local autonomy, states' rights, federal authority and international interest. Of necessity, it must work out and establish in practice those principles which prove these five to be *not* antagonists—each against all the others—but as necessary to each other as are the various parts of music to a grand harmony.


BUSINESS DISTRICT A SMALL CITY
COLLEGE OF AGRICULTURE
CITY RESIDENCES
ELECTRIC RAILWAY LINE
ELECTRIC RAILWAY LINE
FARMER'S HOME
THE ACRE (SHOWN IN BLACK, BELOW) WAS BOUGHT FROM THE UNITED STATES BY PRESENT OWNER'S FATHER FOR ---------- $1.25
IT WAS SOLD TO FIRST RAILROAD FOR --- $12.50
THE RAILROAD ABANDONED IT
IT WAS THEN SOLD A SECOND TIME FOR --- $125.00 (TO THE COMMON CARRIER NOW OPERATING)
WHEN THIS FARM IS VALUED, TO BE TAKEN OVER "FOR PUBLIC USE" AS AN EXPERIMENTAL FARM, WILL THE ADVOCATES OF THE "HISTORICAL METHOD" APPLY THAT METHOD TO THE COMMON PRODUCER'S PROPERTY — THE SAME AS TO THE PROPERTY OF THE COMMON CARRIER WHICH IS NOW OPERATING THROUGH THE FARM?
RAILROAD NOW IN OPERATION
ABANDONED RAILROAD RIGHT OF WAY
HOW MUCH VALUE WOULD THE "HISTORICAL METHOD" GIVE THE COMMON PRODUCER FOR THE ACRES REVERTED TO HIM, FREE, FROM THE ABANDONED COMMON CARRIER?

A Problem for the Application of the "Historical Method."

In the telephone field, first of all, will men practice those principles which are destined to harmonize most of the conflicting theories now prevailing in the various fields of human endeavor."

How can the telephone man afford to damn his bigger brother of the common carrier family, the railroad? How can the railroad afford to ignore so valuable an ally? How can their work be done, unless the two get together for the greatest good for the greatest number?

Must not the misguided public mind be guided aright? Has anybody else as easy access to the facts as the common carriers? If the common carriers neglect to unitedly do their best to put the truth, the whole truth and nothing but the truth, before their misguided master, the public, how much comfort will be gained by cursing the boss for having been "wrong"?

The public is one boss that cannot be "fired"—no, not even by the biggest telephone company or railroad, nor by all the railroads and telephone companies combined. It is a case in which common carriers will have to do one of these three things:

(1) Get the public into a right state of mind and heart.

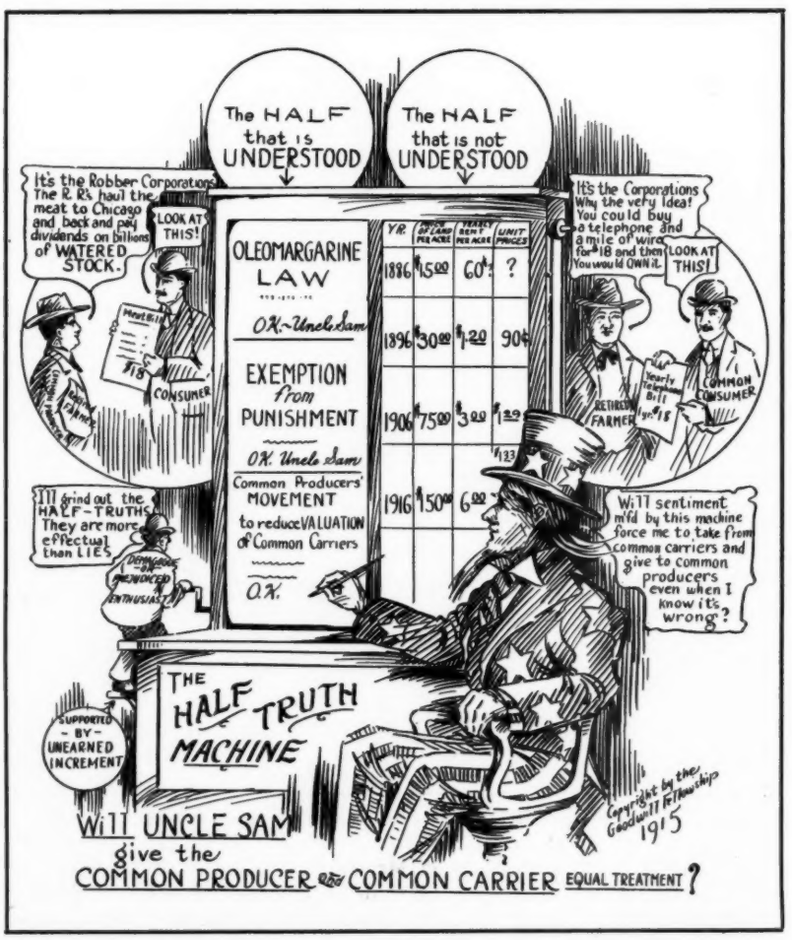
(2) Quit trying and turn the job over to other men.

(3) Serve a master or public that is wrong in mind and spirit toward its servant.

Which shall it be? Time will tell—is already telling, in fact.

Class in Telephony at Minneapolis Industrial Institute.

Announcement was recently made that the Dunwoody Institute of Minneapolis, Minn., will open a night class in telephony in St. Paul the first of the year. The class, it is said, is already assured of 200 students for the opening.


The HALF that is UNDERSTOOD
The HALF that is not UNDERSTOOD
It's the Robber Corporations. The R. R's haul the meat to Chicago and back and pay dividends on billions of WATERED STOCK.
LOOK AT THIS!
It's the Corporations. Why the very idea! You could buy a telephone and a mile of wire for $18 and then You would OWN it.
LOOK AT THIS!
OLEOMARGARINE LAW
O.K.—Uncle Sam
EXEMPTION from PUNISHMENT
O.K. Uncle Sam
Common Producers' MOVEMENT to reduce VALUATION of Common Carriers
O.K.
YR. | PRICE PER ACRE | YEARLY RENT PER ACRE | UNIT PRICES
1886 | $1.50 | 60¢ | ?
1896 | $30.00 | $1.20 | 90¢
1906 | $75.00 | $3.00 | $2.29
1916 | $150.00 | $6.00 | $4.33
CONSUMER
FARMER
Yearly Telephone Bill $18
RETAILER
COMMON CONSUMER
I'll grind out the HALF-TRUTHS. They are more effectual than LIES.
DEPUTATION OF PREJUDICED ENTHUSIASTS
Will sentiment mold by this machine force me to take from common carriers and give to common producers even when I know it's wrong?
THE HALF TRUTH MACHINE
SUPPORTED — BY — UNEARNED INCREMENT
Will UNCLE SAM give the COMMON PRODUCER as COMMON CARRIER EQUAL TREATMENT?
Copyright by the Goodwill Fellowship 1915

Land Prices and Rent Increase, as Scroll Is Turned by the Blind Enthusiast.

"Telephony's" Home Study Course for Telephone Men

A Complete Presentation of the Principles Underlying Modern Telephony in All Its Branches—Arranged Systematically So That Regular Reading and Faithful Study Will Qualify Ambitious Men for Higher Positions—Prepared Under Supervision of Stanley R. Edwards—This Section Written by Jay G. Mitchell

Quiz Questions on the Preceding Installment.

241. Why is a properly adjusted ringer more sensitive than a magneto drop?

242. Why is it ordinarily impracticable to utilize the line current directly to energize the line lamp?

243. Is the current strength in common battery line circuits always uniform on the various lines?

244. Give an illustration of a central office line relay device in a magneto exchange.

245. Give an illustration of a device for equalizing the line current in common battery switchboards without line relays.

246. What are the essentials in the magneto drop?

CHAPTER XII. The Central Office (Continued).

247. *Reason for enclosed form of magnetic circuit of drop.*—The enclosed form of magnetic circuit insures for the drop the essential qualities previously mentioned. By the use of a return circuit for the magnetic lines of force through the entire cylindrical core, the reluctance of the magnetic ciruit is kept at a minimum. In other words, any given number of ampere turns will produce a much stronger magnetic field in the air gap between the armature and the end of the shell than would be produced between the armature and pole pieces, for instance, of any form of horseshoe magnet provided with the same number of ampere turns. In this way maximum sensibility is assured, for as has been shown, the pull between any magnet and its armature is directly dependent upon the number of magnetic lines of force extending from one to the other.

Since the magnetic circuit of the drop is of a form giving the lowest reluctance, it must follow that, for any given set of conditions—such as a certain number of turns in the winding, a definite frequency, and a fixed resistance—the drop will exhibit the greatest practicable inductance reactance. (For a review of the nature and effect of inductance read Sections 192 to 200 inclusive, TELEPHONY, October 2 and 9, 1915.) In other words, a sudden change in the current flowing through the winding will produce the greatest value in electromotive force opposing the change, whether it be an increase or a decrease.

In the design of the magneto drop this is an extremely valuable quality, inasmuch as it tends to keep transmission losses due to the drop at the smallest practicable value. As a matter of fact, the telephonic current or high frequency transmission losses in the best type of modern magneto drop range from 0.33 mile to slightly over 1.0 mile of standard cable, depending upon the conditions under which the circuit may be working.

248. *Switchboard cross talk and enclosed magnetic circuit of drop.*—The enclosed form of magnetic circuit for switchboard drops is essential for still another reason. The nature of the service to be performed requires that the drops be mounted close together in order to secure maximum accessibility. Were the drops provided with any other form of magnetic circuit than that secured in the tubular form, it would be necessary to separate them considerably farther in order to eliminate the possibility of cross talk.

In Fig. 103 is shown the conditions as they would have to be met in such a case. The drop *A* is assumed to be connected

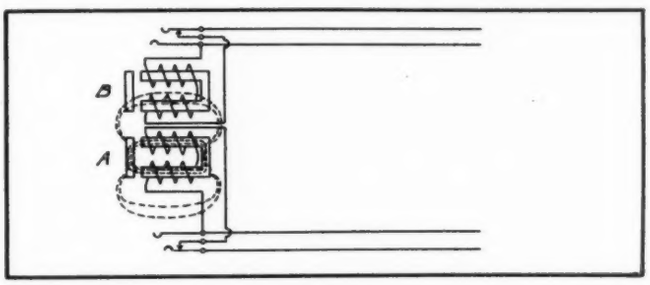


Fig. 103. Cross Talk from Stray Magnetic Field of Old Type Drop.

to a party line over which a conversation is taking place. Since this conversation is between parties all of whom are connected on the same line, the plug at the switchboard is not inserted in the jack and the drop is not disconnected from the line circuit. More or less of the telephonic voice currents from the line will pass through the winding of the drop. These currents in the drop winding will be productive of more or less fluctuating magnetic field in the space surrounding it.

If the adjacent drop *B* is mounted, as shown, within the space into which these lines of magnetic force extend, it will be subject to a more ~~or less~~ strong fluctuating magnetic field in its own core and armature. The magnetic disturbance in the core and armature of drop *B* will produce an alternating electromotive force in the winding and therefore an alternating current on the associated line circuit. If it should happen that the second line were in use at this time, the parties using it could hear, more or less perfectly, the conversation taking place on the line connected to the drop *A*. Such a phenomenon was more or less common before the invention of the tubular drop.

A little consideration will show that the leakage in the *tubular* drop, however, must pass from the core to the shell and that it is not possible for any appreciable amount to extend outside of the iron casing. This is shown in drop *A*, Fig. 104, in which the dotted lines represent magnetic lines of force leaking from core to shell. It is true, therefore, that the modern tubular drop is cross-talk proof.

249. *The armored drop.*—The armored drop is an intermedi-

ate step in the development toward the full tubular drop. It is effective, to a certain extent, in remedying the defects of the old style drop. In the armored drop the enclosing shell does not entirely encircle the coil of the drop but encloses the larger part of it, about three-fourths in most cases. The schematic

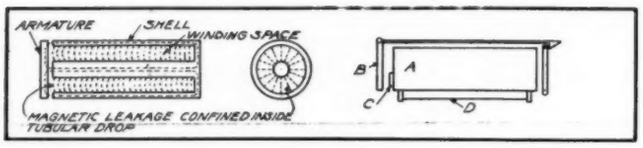


Fig. 104. Magnetic Leakage—Armored Drop.

arrangement of the armored drop is shown in Fig. 104, in which *A* is the armor, *B* the armature, *C* the core, and *D* the lower edge of the coil.

The fact that the modern tubular drop is cross-talk proof is exceedingly important. It must be remembered that not only is the line drop left across the circuit occasionally, but that the clearing-out drop is *always* left across the connection when a cord pair is used and a connection is made between different subscribers' line circuits. If it were not for this feature in the modern drop, it would not be possible to assemble telephone circuits in such numbers as are possible in the present standard of switchboards as to size.

250. *The relay drop line signal.*—In many exchanges using magneto equipment, there is a type of line circuit which requires somewhat different operating methods from the usual town subscriber's circuit. In this class of lines, there are usually a greater number of subscribers on one circuit than is usual in town. These party line subscribers also, in many cases, call each other by a system of code rings without requiring any help from the exchange operator.

When they turn the magneto generator of their telephone to call another station on their line, they necessarily send out the ringing current over the circuit. This ringing current will operate the drop in the switchboard as usual and the shutter will fall. By the use of a so-called relay contact, the drop armature is made to repeat to the operator the code used in making the call. If the code so repeated indicates that the call is not intended for the attention of the operator, the shutter is restored and the drop is left bridged across the line circuit.

The relay contact *A*, Fig. 105, is so wired as to be readily connected to the night bell of the switchboard. It is often not necessary for the operator to make use of the relay feature

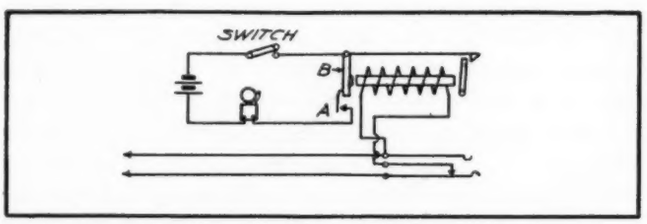


Fig. 105. Relay Drop for Heavy Party Lines.

of the drop in ordinary operating, as there is sufficient sound when the drop armature *B* is operated, to repeat the code in a perfectly intelligible manner to her practiced ear. Drops of this type are necessary for use in connection with heavily loaded rural or farmer party lines.

251. *The common battery target line signal.*—In common battery switchboards of small size, such as private branch exchanges, and in some of the older common battery central office switchboards, the target signal is used for line or supervisory signals or for both. There are several general types of signal that have, in a sense, become standard for this class of searvice. The present tendency of telephone engineers, however, is to insist upon the use of lamp line and supervisory signals in all manual switching equipment except a limited number of private branch exchange switchboards. The use of lamp signals in *this* type of switchboard equipment also is undoubtedly favored by the most prominent operating engineers. It is the present standard to employ lamp line and supervisory signals in the private branch switchboards of large capacity.

The use of target signals in common battery switchboard equipment does not give rise to exactly the same problems in design that are presented in the magneto target signal. In the first place, the common battery line signal is never left across the telephone circuit while a conversation is taking place. The problem of cross talk, therefore, does not enter into the design of the *signal itself*. It is a most important feature, however, in the design of the supervisory relays, as will appear later.

The common battery signal must be of the greatest possible sensibility in order to insure the receipt of the subscriber's

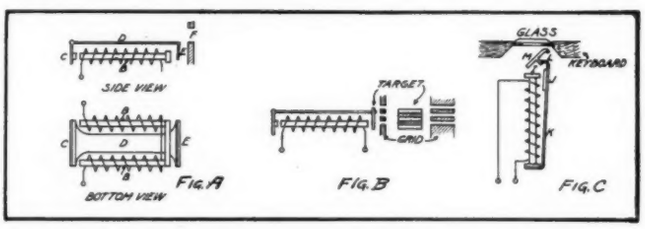


Fig. 106. Typical Forms of Common Battery Target Line Signals.

call at the switchboard. For this reason the form of the magnetic circuit of the signal is of the greatest importance. It must permit of adjustment so that the passage of the weakest possible calling current over the longest circuit in the office to the telephone, will create a magnetic field in the core, armature, and air gap, of sufficient strength to operate it.

252. *Typical structures for common battery target signals.*—In Fig. 106 is shown three of the typical forms employed in the design of common battery target signals. The type used some years ago as line signals in common battery private branch exchanges and for busy line signals in toll switchboards is illustrated in Fig. *A*. The electromagnet, *B*, which is of the horseshoe type, is of sufficiently effective design to permit the use of the signal on the comparatively short lines of the ordinary small private branch exchange. When the armature, *C*, is attracted by the magnet, the lever, *D*, raises the target, *E*, into view in the front of the slot *F*. Since this signal is equipped with a horseshoe electromagnet, its winding is composed of two coils. In the effort to economize in space, these coils, as well as the iron frame and core, are made of very small dimensions.

The signal shown in Fig. *B*, is provided with the tubular shell comprising with the core and armature, the enclosed type of magnetic circuit. This type is very similar in every

feature of electrical design to the magneto target gridiron signal described in section 239, TELEPHONY, November 20, 1915, except that no tap at the middle of the winding is required. It is often used for line or supervisory signals, or for both, in cordless switchboards for private branch exchange service.

253. *The keyboard type of common battery target signal.*—In Fig. 106-*C* is illustrated the structure of the keyboard type of common battery target signal. This signal has been used to a considerable extent for the supervisory signal in small private branch switchboards. It is mounted in the keyboard and appears directly in the vision of the operator, just to the front of the plugs. While this type of target signal is unimportant from the standpoint of popularity, it is interesting on account of the method of affording an indication to the operator from a signal mounted vertically.

The upper head, *I*, of the signal coil is of iron and is a part of the magnetic circuit. When a flow of current takes place in the winding, the armature, *J*, is attracted to the head, *I*. As the armature approaches the head, *I*, its upper extremity, *L*, forces the target, *M*, from its normal position to a horizontal one. In the horizontal position the target is visible to the operator through the glass. When the coil is de-energized by the withdrawal of the current from its winding, the armature is released and the target, *M*, swings by gravity to its normal position out of the sight.

(To be Continued.)

Beginning a New Decade

One Changing Condition—Danger of Over-Sensitiveness

By J. C. Kelsey

"Men may come, men may go,
But I go on forever."

It was the brook as it finds its way to the sea from a source secure and permanent in the high hills above, that Tennyson so marvelously described. Nothing ordinary can stop its merry bubbling career and it will forever go on undisturbed, unless some unexpected deluge of Nature changes all our plans.

Likewise, it is apparent in our telephone life that the business will go on forever unless some great force of Nature utterly changes the course of humanity on the surface of the earth.

We have learned that the changes in the earth have not been abysmal or sudden in awfulness, but have come from the daily warfare of sun, wind and rain—three apparently mild forces most useful to us.

So the telephone business will go on forever, and its changes will be gradual and not revolutionary. These changes have been gradual in the past and they will be gradual in the future.

Occasionally an alarmist suddenly discovers that the light of the sun has gone out, but he soon finds that it has only been behind a fleeting cloud or that his vision was obscured by some defect.

It has been a chronic condition of our business that continual search is made for some seer to tell us that the good old days have gone forever.

Who wants to go back to the good old days? Who wants to go back to the stage coach, the coon skin cap and the axe? Who can say that our ancestors at any stage of existence had anything we really wanted?

We do know that each generation in its turn has never failed to mourn for the good old times. It is a matter of history that men and women are prone to look back. It was Lot's wife, who dreading the new life she was about to face, looked back upon the good old times with great longing. Somewhere she still stands, a pillar of salt, a monument to the folly of failing to appreciate the present and to anticipate the future.

"Men may come, men may go,
But our conventions go on forever."

As we look back over the conventions of the last decade, it is easy to see that the changes have been following Nature's plan of graduality. But when one studies the lists of men who attended them, it comes over him chillingly that the brook was right—it goes on forever, but the men do not.

If you doubt, look over the names of past presidents, look over lists of officials, the personnel of committees and the names of those in attendance.

At random I picked a committee on nomination at the 1905 convention. Do you remember these names: Lichty, of Iowa; Harper, of Wisconsin; Wells, of Kansas; Cole, of Kentucky; Rawson, of New York; Dunaway, of Texas; Conklin, of Illinois and Tetu, of Tennessee? Mind you this was only ten years ago!

True enough, men may come and men may go, but the convention will go on next week and not a man of ten years ago will be missed or considered necessary.

It certainly should teach us all not to take our beliefs and conditions too seriously. It should teach us to be more charitable toward our fellow telephone men.

Not one of us will go down to immortality; therefore, why waste our time doubting, fearing, hating and disagreeing, trying to retard, in our feeble way, what little progress may be vouchsafed to those of us who still live in this telephone decade.

To him who bears animosity towards his neighbor, let him get through his head that the next decade may find him missing. He may be dead, he may be in another business, he may have changed his mind, besides the facts may have proved him to be wrong. It is a serious and even foolish thing for men who have been intimate friends for years to suddenly grow cold towards one another just because of an apparent difference of opinion or condition seems to arise.

In the telephone business we are not free from the charge of over-sensitiveness. We have plenty of cases where associations of a lifetime have been disrupted in an hour, in a moment and, worst of all, it does not stop there.

We are all human—let us not forget that. I learned that telephone men were human when early in the telephone business. We cannot be expected to rise above the weaknesses of human beings in general, but we can con-

quer some of our tendencies to forget that our business is a local issue.

We must realize that each man has his distinct problem, and that he must face it himself. We must remember that the things we criticize men for are likely to come home to us in the twinkling of an eye. Well do I remember how the representatives of a manufacturing company who were merciless toward the Kellogg company at a critical time in its corporate life, were crushed and rent by the news that the Bell company had acquired temporary control of their property too.

The greatest impression that I have of our national association and convention life is that we have wasted time. Too much time was wasted on idle things at a time when the important things of business life were lost sight of entirely. For several years the energies of Independent telephone associations were directed against one lone manufacturer. It mattered not that judge and jury had not yet decided the case, the associations went right on deciding the case for themselves.

We could have done better things. We could have studied the sublicensee situation and kept the small telephone company away from the Bell lines. Proper energy at that time would have saved the local telephone switchboard terminal to the exclusive use of the large Independent telephone companies. Today, the Bell long-distance lines share the Independent switchboards with their Independent rivals.

I do not like to go back so often to Schlosser, of Gibson City, Ill. This man was but a skirmisher on the sublicensee firing line. He merely echoed a wish in his heart that his company should have Chicago connections, just as you have always had St. Louis, Kansas City, Philadelphia, Louisville, Indianapolis, Columbus and others in an Independent way.

The association did not consider his local needs, but attempted to make an example of him by throwing him out of the convention. At that time only 167,000 Independent telephones had Bell connections, and they had not begun to share local switchboards with their more powerful Independent competitors.

It is not my right to criticize any action of a former convention—the intention is to call attention to the past for the benefit of the future. An association is something like our government, in a military sense—it is all defensive and not for offense.

It is the duty of a national association to defend the business, but it cannot be an offensive agent, for we can never hope to agree on the management of an offensive campaign. We have not the means to provide for an expensive campaign of offense. We have natural safeguards and can depend upon them if we but agree among ourselves to refrain from civil war.

Ever since the world began, there has been a contest over some form of a thing rather than the thing itself. It is not known that nations have gone to war over the dispute of baptism, but it is known that great groups of men have come to blows as to whether the convert should be sprinkled or soused under the water.

Men have come to blows as to whether it was proper to say prayers while standing up or when in a kneeling posture. Men have even become enemies at a prayer meeting trying to decide on the exact date of the rain to be prayed for. These things likewise may be applied to telephone men, by saying that we have quarreled over the form of things rather than the things.

No one of us can drive any group of men into the Bell company by any form of convention legislation. The Bell company in many respects is a closed corporation and entrance to its charmed circle cannot be secured by any known principle. No court, potentate, or employe can break into that select circle without years of effort. Yet we, by voice or opinion or resolution or organization, undertake to do that very thing.

It surely is plain to everyone that no Independent telephone man can be converted into a Bell man by any act of convention or association.

The Bell company is really an oligarchy. It is an oligarchy of men and not of stock or money. It is a group of men and no more. When you try to do anything with the Bell company, you deal with these men. There are only a few of them and they do not all appear in the annual reports of the A. T. & T. Co.

The Bell company consists of Theodore Vail, Union N. Bethell, Frank H. Bethell, B. E. Sunny, William T. Gentry, Casper E. Yost, E. B. Field, George E. McFarland, H. B. Thayer, H. J. Pettengill and N. C. Kingsbury, and possibly others.

I doubt very much if many of these men know or care about our resolutions or opinions as to whether our neighbor is a Bell man and should not belong to our association. The only way these men can be reached is by concerted action and its resulting efficiency.

Any concession or so-called concession which may be expected or wrung from the Bell company, must come from these few men. Can you not see the futility of noise and quarrel in any effort to compel anything from this small group of men?

They are only human. They must laugh sometimes at our efforts and at our conceptions of them. The only concession—and by the way, we are not asking or demanding concessions—to be obtained from the Bell sources at all must come from their necessities and not by our desires. We can make necessities for them only by concerted action.

I have noticed one thing about these so-called Bell concessions: When the Bell officials do make one, they look at it through a miscroscope, and to their eyes it looks to be a gigantic waiver of their rights and privileges. The Independents look at the same concession with the microscope reversed and, naturally, they can't see anything to it unless it might be vast numbers of "niggers in the woodpile." We will never see the day when any arrangement between Bell and Independents will be looked at through the same unanimous glasses.

The Bell interests, for instance, looked at the qualified toll line agreement through magnifying glasses, but every blessed Independent I know, reversed the glass when he looked at it.

In 1905, the prevailing convention idea was future unity, shoulder to shoulder, elbow to elbow, etc. History this coming week should merely retain its old habit of repeating itself.

During 1906 and 1907, the energy of the shoulder to shoulder element was wasted on a manufacturers' stamp matter. However, in 1907, after one speaker had told the delegates that "ye stand like giants as ye are," and Mr. Brailey had spoken feelingly of the strength of the chain, some one suggested that the Independent telephone cause be advertised as a business.

At this time—June, 1907—a new king rose in Boston and his name was Vail, The First.

The 1908 convention recorded a roll call of the states, and a protest over the failure of the manufacturers to adhere to the practice of placing stamps on invoices, was entered. The outlook was described as optimistic and a very foolish song entitled "Good-bye, Blue Bell," was sung.

But it remained for 1909 to break the record of offensive strategy. It was decided to spend $125,000 on publicity. As a token of good will and affection, the newly-organized Continental Telephone & Telegraph Co. gave $50,000 and pledged an additional $10,000. Other peoples' money never bothered this corporation at all.

Time proved, however, that this offering had no legal and financial standing, and the generosity of the Continental company still stands on the books as an uncollected account. Lest you forget—the Continental Telephone & Telegraph Co. was the last dying effort of the promoter in telephone matters.

The years 1910 and 1911 saw some excitement, such as Blackstone meeting and much blue sky activity. There was talk of commissions, favored companies, individuals on the inside, etc. Men flocked to the conventions about as much agitated as they have ever been.

Out of it remains the one great and shining fact, it was helping the business to eliminate promoters, speculators and men who did not follow the telephone business for a livelihood. It all gets back to my claim that our business will never reach its maximum power until every man is in the business for necessity's sake and loves the business, accordingly.

The following years are fresh in your memory. You are standing on the threshold of a new and unified life. I hope nothing happens to mar the bright escutcheon of our future.

It is your duty to come to Chicago on the morning of December 8 and to attend every meeting. Remember that one must give and take in this world if he shall accomplish the most. Remember, too, that each man, each company, has its own distinct problems, but that each one is just as Independent and sincere as his neighbor.

Remember that the Bell company is somewhat jealous of its rights and it may blackball any candidate thrust upon it by association resolution or opinion.

Let us not quarrel over sprinkling and immersion, but agree that baptism is necessary . Let us not argue over kneeling or standing, but agree that prayer is good. Let us come together with an old-fashioned Christmas spirit of good will toward all telephone men.

MORAL: Don't stand on the order of your coming.

Telephone Transmission and Its Relation to a Plant

Investigations of Transmission Arousing Interest of United States Bureau of Standards—Transmission the Master Element in the Telephone Business—Two General Considerations Involved in Its Study—Paper Presented at Convention of Ohio Independent Telephone Association

By H. D. Currier

Telephone transmission has been given more consideration by Independent telephone men in the last year than at any time since the start of the Independent telephone movement. This interesting subject should receive the joint consideration of all telephone men.

We may disagree regarding construction, operating and central office design, and even the business methods proper to adopt in handling a property, but the one subject we are bound to agree on is the necessity of good transmission. This is explained by the fact that the telephone using public is more capable of judging the quality of this element of service than any other. The telephone man realizes this capability and naturally he endeavors to cater to the understanding and appreciation of the customer.

It has been the good fortune of the writer and other manufacturing men to have collaborated with operating engineers in standardization work. The analysis of the work this committee desired to accomplish provided conclusively that no headway could be made in arriving at proper standards, as applied to construction, design, operating and management, until a proper understanding was obtained as to the relation of transmission to the many other elements involved in the telephone business.

The study of telephone transmission, as applied to an operating plant, reflects improvements in all other branches. Upkeep of the plant, substantial construction, high insulation resistance, proper use of cords, and all the other considerations met with in operating, are essential to good transmission and will take into account the inefficient practices prevailing in other departments.

The influence of this investigation has also resulted in the manufacturers working out more efficient designs. The endeavors of the manufacturers will benefit the operating companies and contribute to the future value of the plant.

The investigations in regard to transmission, which are now being conducted, have awakened the interest of the United States Bureau of Standards as Washington, and the time is not far distant when a man caught selling short measure in transmission, will be classed with the fellow using a false bottom in a peck measure. This brings up the point as to what is a "peck measure" of transmission. Just as the peck is a fractional part of a unit of measure adapted by our government, we will some day see the mile of artificial cable of a given specification, standardized by an authoritative body and representing a fractional part of the maximum line by which transmission is measured.

The importance of this subject should be appreciated when it is pointed out that it was the one element of the telephone problem which awakened sufficient interest in the mind of the director of the Bureau of Standards at Washington to cause him to have the studies being made along this line investigated. The investigations made by the United States Bureau of Standards have caused it to approve the idea of meeting in Washington to discuss this problem, and a meeting will be held there soon. Several of the manufacturers, who are assisting in the investigations along this line, are building demonstrating sets which will be sent to Washington for the use of the Bureau of Standards in studying this subject.

The reason the Bureau of Standards is interested in the subject of telephone transmission is because it is the most important element of service which the public buys, and the government is interested in seeing that a man receives full measure for money paid.

It was said that telephone men should agree on transmission. It seems proper to make the suggestion at this time that any joint committees of the two national associations, which may be appointed could well include one which will deal with the subject of standardization, and use transmission as a basis for conference.

It is not the purpose of this paper to deal with numerical

values as applied to transmission. Detailed information will soon be available in bulletin form. The standardization committee of the Independent Telephone Association of America, which has been organized since your last convention, will issue a bulletin, which will show tentative recommendations as applied to transmission. I hope it is the plan of the two national associations to have a joint discussion at the Chicago convention regarding standardization. The proceedings of the Chicago convention combined with the bulletin referred to, will, I believe, supply you with all of the detailed information on this subject you may desire.

It is my purpose in discussing the subject of transmission to impress upon you its importance in relation to the business you are following. The state associations are now employing service engineers. If you will refer to the reports of these engineers or to papers which they have read before conventions, you will find the first problem they were called upon to solve was that of transmission.

The activities of a service engineer cannot be centered on one subject alone; neither can he treat with the broad problem of standardization. The benefits to be derived from his endeavors are not to be questioned, but it seems reasonable that the national bodies representing the Independent telephone movement in the United States should delegate somebody to carry on this work of investigation so that the telephone companies, as a whole, may be benefited.

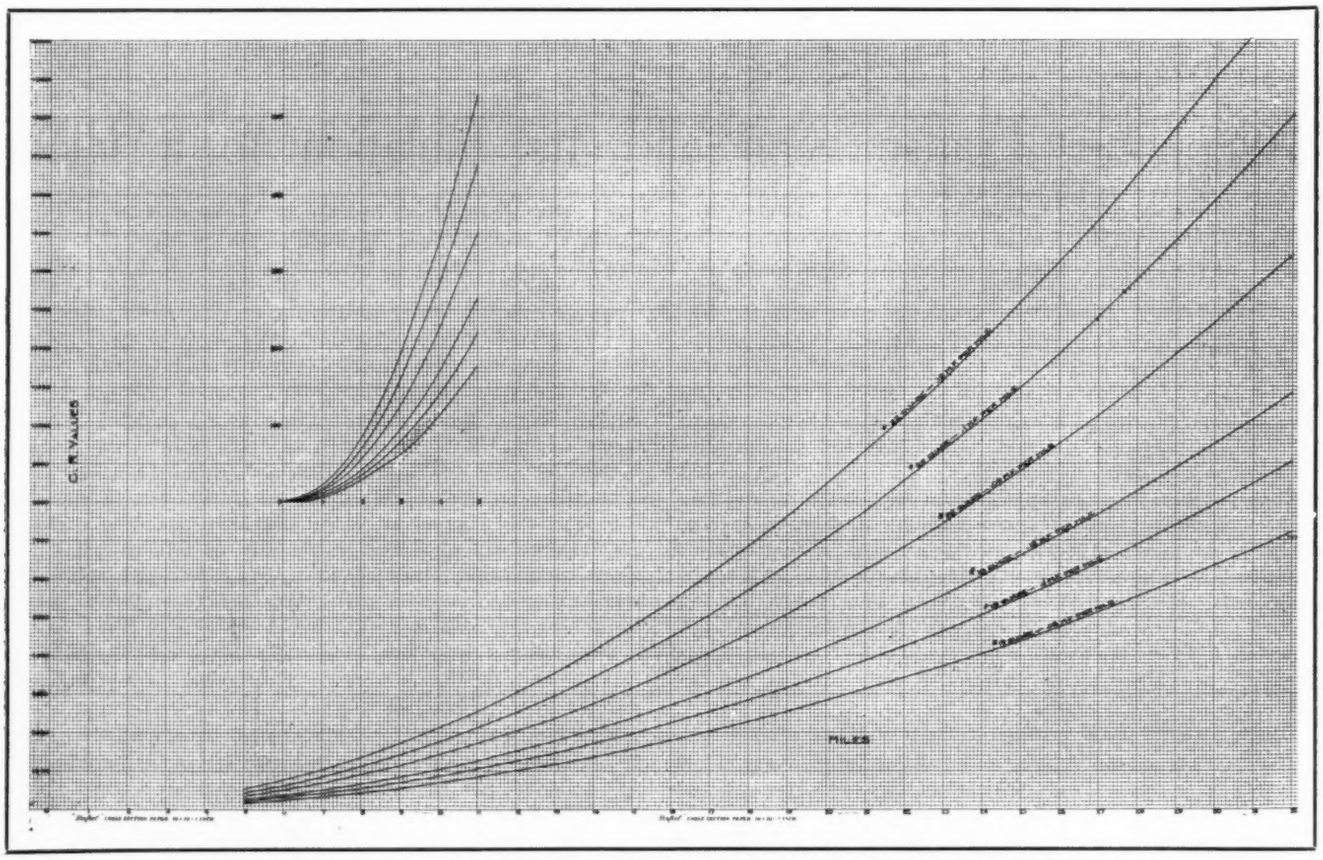
There are many executives, today, considering large expenditures in construction material, who do not know that their substation transmitters have increased in resistance so that a large percentage of them will measure above 600 ohms. They do not know the detrimental effect these transmitters are having on transmission. They do not know at what point in the increase to resistance, transmitters should be replaced, and they do not have authoritative information telling them how to prevent this transmitter deterioration.

The proper spacing of the diaphragm on a receiver is of the utmost importance. An increase of the air gap a few thousandths of an inch may cause enough detrimental effect to require excessive expenditures in construction work to overcome the loss.

The phonograph is one form of producing audible speech artificially. What man is there in the telephone business who would stand for as much efficiency variation in his phonograph as he puts up with in his own telephone plant? It is true the industry is made up of so many technical considerations that we are to be excused for laxity in some things.

There is usually one element in a complex problem which lends itself to analysis, and the solution of this element helps in answering others. I believe the subject of transmission is the master element of the telephone business. The study of transmission involves two general considerations, viz.: High frequency loss and current supply loss.

The laws and commercial conditions to be met in considering high frequency loss, apply to both common and local battery. Current supply loss must be considered separately as applied to either common or local battery. In overcoming high frequency losses, we must investigate repeating and induction coils, condensers, bridged impedances and line construction.



Relation Between Cable of Different Specifications with Regard to Transmission Dissipation.

Repeating coils having 3½ miles of cable loss represent 11 per cent. dissipation in transmission. It is possible to obtain coils having only 1½ per cent. loss. When we realize 100 miles of No. 12 B. W. G. iron wire is the equivalent of 32 miles of standard cable and two repeating coils may be introduced in a toll line connection at the terminal ends, these coils having 3½ miles of cable loss, it is hard to believe we can only have 73 miles of toll line before the limit of commercial transmission is reached.

If we continue the analysis and take into account all other terminal losses, we will find in the case of local battery, a loss at each end equal to five miles of standard cable, which would limit the toll line to 45.3 miles. The average condition in common battery work is very much worse. Some circuits which

have been calculated, show less than 25 miles of No. 12 B. W. G. iron wire toll line which will cause a reduction of transmission to the limit of permissible attenuatoin.

Current supply losses in local battery transmission are mostly due to depleted dry cells. In common battery work, the current supply losses are due to high resistance cord circuits, resistance of subscriber's loop, design of substation instrument circuit and high resistance transmitters.

A common battery subscriber located two miles from the exchange, having a loop made up of No. 22 B. & S. gauge cable with a mutual capacity of 0.074 mf. per mile and supplied with talking current from a 24-volt battery, would dissipate 40 per cent. of available transmission or would reduce the permissible toll line of No. 12 B. W. G. iron wire to 60 miles, and this would not include the receiving loss at the other end. If the subscriber at the other end had a loop of the same kind, the toll line would have to be reduced to 51 miles. This reasoning could be continued until the toll line would be reduced to a very low figure.

These are losses entering into transmission which few companies realize. When we go after these losses and take out inefficient repeating coils, deliver proper current to substations, investigate our substation equipment and remedy the faults when found, we will put our plants in a much better physical condition.

The only way to reduce our current supply losses due to No. 22 B. & S. gauge cable is to increase the battery potential at the central office, or put in No. 19 B. & S. gauge cable on the longer loops. It is obvious the greatest immediate benefit can be derived from increasing the central office battery. Even this will do no good if we leave the high resistance battery supply coils in our cord circuits.

Operating companies have had no means whereby they could study transmission equivalents. The use of an artificial cable is looked upon as some mysterious technical accomplishment. The fact is that it is the most crude way imaginable to measure transmission. Anybody with sense enough to listen in a receiver and tell when the volume and articulation sound alike over the circuit under test, compared with a standard circuit, can make transmission measurements. Even if the operating companies do not all purchase artificial cables and make studies on their plant conditions, it seems that the state associations employing service engineers should see that an artificial cable is provided and that the service engineer is instructed to determine the transmission efficiency existent.

The operating man will claim, due to the fact that less than 3 per cent. of his originating toll line business extends beyond the 50-mile limit, it is unnecessary to take all these precautions in order to bring the efficiency of his plant up to the proper point. A study of operating properties will show in a great many cases that the value of transmission obtained up to the 50-mile radius, which represents over 95 per cent. of the originating toll line business, is not as efficient as could be obtained over a circuit 900 miles long of No. 8 B. W. G. copper wire with proper terminal apparatus at each end.

Another thought with which the operating man usually consoles himself, when the question of transmission efficiency is brought up, is the fact that: "Well, I am receiving no complaint from my subscribers." There are operating men, members of this association, who will testify that the toll revenues from given towns were materially increased when proper substation equipment was installed and the central office apparatus was placed in proper condition.

Good transmission rendered to the public is like good operating. Give a community first class service as regards duration of time in the establishment of connections and it is a well known fact the load values on an exchange will go up, because people will use a telephone more if it is a pleasure for them to do so.

The long distance business contributes largely to the earning power of a telephone property. If this earning power can be materially increased by a proper analysis of the things necessary to produce good transmission, the expense involved will be returned in a very short time.

Independent operating men are not competitors. They can deal with this subject of transmission collectively. The manufacturer has in the past supplied most of the technical data upon which our industry is founded. The operating man should tell the manufacturer how good he must build equipment. The ruling of the operating man on this subject will be equally applicable to any system of central office practice. To bring the plants in the United States to the proper standard in transmission does not mean the abandonment of present plants.

If the men who manage properties will investigate the investment ratio as applied to central office and substation equipment compared with the outside plant, they must agree it will be well worth while to bring this central office and substation equipment up to a proper degree of efficiency.

The accompanying curves show the relation between four different specifications of cable with regard to transmission dissipation. These curves are worked out on the basis of Sir William Preece's KR law. The presentation of differences in cable by this method obviates the necessity of mathematical calculations from fixed formulas and it is hoped that these curves will be assistance to plant men in studying transmission losses. The group of curves at the left is an enlargement of that part of the longer curves from 0 to 5 miles.

Telephone Development in Saskatchewan, Canada.

Telephones now cover Western Canada like a net. A table recently compiled by the Canadian Pacific Railway shows how remarkable has been the development of the industry in the province of Saskatchewan since 1910. Some of the figures tell their own story and are as follows:

	Pole Miles, Long Distance.	Wire Miles, Long Distance.	Exchanges.	Toll Offices.
February, 1910	1,132	3,280	20	100
February, 1911	1,647	4,404	33	143
February, 1912	2,163	8,171	70	195
February, 1913	3,172	11,857	93	280
April, 1914	3,388	13,714	96	298
April, 1915	3,622	15,760	99	311

The number of telephone stations in the province is made up as follows:

Saskatchewan government stations	15,587
Rural stations connecting with government exchanges	6,385
Municipal systems	359
Independent telephone companies	943
Rural stations not connecting with government exchanges	6,333
Total	29,607

The big crop this fall has made the farmers prosperous and the telephone companies of Canada already are sending out solicitors in the mixed farming districts to get new subscribers.

How an Iowa Company Solved the Efficiency Problem.

The Woodbine Telephone Co., which operates exchanges at Woodbine, Logan, Dunlap and other towns in Harrison county, Iowa, employs a unique method of securing the highest possible efficiency from its operators.

In addition to paying them a regular salary, M. A. Reed, in charge of the office work, offers an additional sum to be divided upon a percentage basis among the different exchanges for efficiency in teamwork. The amount is again sub-divided upon a percentage basis among the operators of the exchanges winning first, second or third position.

There is keen rivalry among the different teams of the telephone system, and as a result, it is said, the patrons of the exchanges are given high grade telephone service.

Amendments to Rules Governing Deposits in California

Supplemental Order of California Railroad Commission Modifying Several of the Rules Established in an Order Issued August 12, Governing Service Deposits, Connections and Extensions of Water, Gas, Electric and Telephone Utilities

Amendments to Rules Governing Deposits in California.

The California Railroad Commission, in an order issued August 12, established 18 rules governing service deposits, connections and extensions of water, gas, electric and telephone utilities, which were to have become effective October 11. Prior to October 11 a number of petitions for rehearing were filed. The commission then reconsidered some of the rules and in a supplemental order dated November 5, amended several of them.

Rule 2 originally read as follows:

If an applicant for metered or measured service make a cash deposit to insure payment for service to be delivered, the amount of the deposit shall be such as may be specified in the utility's rules, but in no event in excess of twice the average periodic bill of consumers of his class; provided, that the deposit for domestic or residence monthly service of water, gas, electric and telephone utilities shall not exceed $2.50.

It has been urged that a deposit of $2.50 is too small in certain cases. After reconsidering the matter the commission reached the conclusion that that amount may not be sufficient and that the following provision be added to Rule 2:

except that where the average of the monthly bills of those consumers of any class of domestic or residence service who make deposits is in excess of $2, such consumers may be called upon to make deposits of uniform amount not exceeding twice such average.

Rule 6 in the original order provides that:

A water, gas, electric or telephone utility may not discontinue service by reason of non-payment of bills for metered or measured service theretofore delivered.

It has been modified to read as follows:

A water, gas, electric or telephone utility may not discontinue service by reason of non-payment of bills for metered or measured service theretofore delivered, in cases in which there is a dispute as to the amount of the bill. In case of such dispute, the consumer shall deposit with the railroad commission the amount claimed by the utility to be due, whereupon the railroad commission will investigate the facts and communicate its findings to the parties. Failure on the part of the consumer to make such deposit within 15 days after demand by the utility that such deposit be made, shall warrant the utility in discontinuing the service.

This rule as originally drawn up was intended to cover the case in which the consumer contests the amount of the bill and the utility, by reason of shutting off his service, compels the consumer to pay a bill which he believes to be unfair and unjust, a number of such cases having come to the commission's attention.

Rule 7 originally read as follows:

A telephone utility may, under uniform, non-discriminatory rules and regulations, extend the convenience of sending telegrams and long distance telephone messages on credit to all its patrons or to the extent of such deposits as any of its patrons desire to make.

Some objection has been made to this rule for the reason that it does not specifically accord the telephone utility relief in case telegrams and long distance telephone messages which have been taken on credit are not paid for. In order to remove this objection, the rule has been revised to read as follows:

A telephone utility may, under uniform, non-discriminatory rules and regulations, extend the convenience of sending telegrams and long distance telephone messages on credit to all its subscribers. If a subscriber's credit is impaired by his failure to pay for such service rendered, the utility may, after the reasonable notice specified in Rule 5 herein, unless there is dispute as to the amount of the bill, deny to him further telegraph or long distance telephone service until he pays the amount due and makes a deposit, not in excess of twice his average periodic bill for such service, to cover charges for future telegrams and long distance telephone messages.

Rule 17 reads as follows:

In any case in which an applicant makes a payment to secure the construction of an extension by a water, gas, electric or telephone utility, such payment shall be considered as a loan to such utility, to be repaid under reasonable, non-discriminatory rules and regulations. Interest shall be paid on such loans at the rate of 6 per cent. per annum.

This rule, the commission states, is based on two fundamental principles:

1. In general, the utility itself should own the instrumentalities by means of which it renders service. There are, of course, exceptions to this general principle.
2. If the circumstances are such that it is reasonable to ask the applicant to loan the money or portion thereof, with which to construct an extension, provision should be made for the repayment of the loan in such cases and in such amounts as may seem fair and reasonable.

There are cases, however, in which the revenue to be derived from the extension is not sufficient to justify the payment by the utility of interest on the loan. In such cases interest should not be paid. To remove uncertainty, the commission eliminated the last sentence of the rule, thus leaving the question of the payment of interest to be covered by the rules and regulations to be filed by the utilities with the general rule therein established. Rule 17 should, accordingly, be modified to read:

In cases in which applicants make payments to secure the construction of extensions by water, gas, electric or telephone utilities, such payments shall generally be considered as loans to the utilities, to be repaid, as soon as conditions warrant, under reasonable, non-discriminatory rules and regulations.

Part 4 of the original order reads as follows:

Within 30 days after the effective date of this order, each water, gas, electric and telephone utility shall return to the depositor all deposits heretofore made to guarantee payment for flat rate service and all deposits made to guarantee payment for metered or measured service by patrons who have paid all their bills promptly during the 12 months prior to the effective date of the order herein.

Some utilities, the commission states, have taken the position that it would be a hardship for them to be compelled to return at once in cash the deposits which they are directed to pay. To take care of these cases the commission has modified the rule by providing that the utilities may apply the existing deposits against current bills until such deposits are absorbed, subject to the provisions of Rule 10. Part 4 of the order now reads:

(*a*) Within 30 days after the effective date of this supplemental order each water, gas, electric and telephone utility shall return to the depositor all deposits heretofore made to guarantee payment for flat rate service, and deposits made to guarantee payment for metered or measured service by customers who have paid all their bills promptly during the 12 months prior to the effective date of this supplemental order, and (*b*) within 30 days after demand, each water, gas, electric and telephone utility shall return all deposits made to guarantee payment for metered or measured service to custom-

ers who have paid all their bills promptly during the period of service in cases in which the service has lasted less than 12 months; provided, that such customers shall show ownership of the premises or shall offer guarantors satisfactory to the utility; except that if the utility so desires it may apply the existing deposit against current bills until the deposit is absorbed.

This supplemental order became effective December 1 and the utilities of California are given 30 days from the date of the order within which to file new rules and regulations. In view of the modifications made in the original order the commission deems it unnecessary to grant a rehearing and accordingly ordered that the petitions for rehearing be denied.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision Over Telephone Companies, Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchises, Rates and Service

Court Rules on Rate Controversy in Syracuse, N. Y.

Justice John S. Lambert, of the appellate court of Rochester, N. Y., recently reversed the decision of Justice Edgar C. Emerson granting Dr. Dwight H. Murray, of Syracuse, an injunction restraining the New York Telephone Co. from cutting off service unless he paid the present rate of $60 per year. Not only did the appellate court reverse the decision of the trial court, but it held that all the facts now in evidence are sufficient and it is therefore unnecessary to order a new trial.

The decision ends a three-year fight which began when Justice Hubbs first granted a temporary injunction in May, 1912. The city financed the prosecution, with Dr. Murray appearing as the plaintiff to make a test case.

The action was watched with great interest by telephone subscribers in Syracuse for it involved the entire subject of telephone rates in that city, which it was sought by the action to limit. The basis of the action was an alleged provision in the franchise granted the telephone company and its predecessors which expressly prohibited increases in rates and demanded at the same time the best service obtainable.

"Apparently it is possible to offer to plaintiff this old and now practically obsolete form of service (ground return) and to use it in connection with the improved and modern service afforded others," Justice Lambert held, "but it also appears that such attempt will be coupled with disrupted and unsatisfactory service in the efforts to afford telephonic connection between plaintiff's telephone and telephones of other subscribers.

Our conclusion is that the grant of 1887 required the telephone company to adopt this improved service and that after February 1, 1893, there was no restriction, as a matter of contract, upon the rate to be charged, and no restriction as a matter of contract against the discontinuance of the grounded service. When, later, in 1897, a new restriction was created, that restriction did not reinstate the prohibitions existing prior to February 1, 1893, but merely sought to preserve the schedule of rates within the limits in existence in 1897, at the time this latter grant was made."

After removing from consideration the debatable contractual relationships between the telephone company and its subscribers, Justice Lambert took up the contention of the telephone company that this action was not one properly to be heard in a court of equity, in that the question of rates was one for the public service commission to handle. The court sustained that contention.

After reviewing the various statutes conferring the power of tariff regulation in telephone companies upon the public service commission and holding these statutes to be entirely sufficient, Justice Lambert added:

"The conclusion has its foundation in the assumption that the filing of the tariffs in compliance with the requirements of the statute gives to those tariffs a presumption of fairness which is conclusive until the same are actually reformed or modified by the commission.

If then, failing in establishing a contractual status entitling him to equitable relief, the respondent seeks to maintain his standing in this action upon the general relation which he sustains to the telephone company, as one of its subscribers, he is fully answered by the suggestion that if he has complaint to make as to the rates he must make it before the public service commission."

Final Hearing in Mountain Home Rate Case.

John P. Kellas, for the complainants, and C. Walter Artz, for the company, on November 23, made the final argument in the long pending rate case against the Mountain Home Telephone Co., before the New York Public Service Commission. The board of trade of the village of Malone, patrons of the Chateaugay and Burke exchanges and St. Lawrence County Pomona Grange have united in these complaints alleging unsatisfactory service and rates unreasonably high.

Mr. Kellas, for the complainants, reviewed the testimony given which, he said showed that under the old competitive order the locality was better served and at cheaper rates. He also argued that there was a question of the legality of the company's franchises and as to the method in which its constituent parts had been merged.

Mr. Artz, for the company, maintained that no evidence had been produced by the complainants to disprove the company's contention that the present rates were even yet too low to afford a fair return on the property devoted to the public service. He cited the testimony of a canvasser of the company to show that there was very little dissatisfaction over the service and said that this testimony had been borne out by the testimony of the complainants' own witnesses.

He argued that the validity of franchises and capitalization was matter already passed upon by the commission and that the commission in the present case had refused to allow this matter to be re-argued. At the conclusion of the two arguments both sides requested a short time in which to file possible answers to the briefs submitted at this hearing. The commission granted one week for this purpose, after the expiration of which time the case will be decided.

Valley Home Telephone Co. to Issue Additional Stock.

In an order handed down by the Michigan Railroad Commission on November 24, the Valley Home Telephone Co., of Saginaw, Mich., was authorized to issue $814,261 par value of preferred stock in accordance with its articles of association, as amended, the stock to bear interest at 7 per cent. per annum. Of this issue $489,261 par value shall be exchanged for a like amount of the same kind of stock at present outstanding, the exchange to be made on a basis of share for share. The balance of the issue, $325,000

par value, may be sold at not less than its par value, and the proceeds to be expended in extensions, additions, improvements and betterments to its plants and properties.

According to General Manager Warren B. Serviss, since the first of the year, the company has had a net growth in its various exchanges of more than 1,200 subscriber stations, this growth being largely in Saginaw and Bay City. Applications for telephone service in these two exchanges are being received so rapidly that a net addition of 200 telephones a month is being constantly made. Unless the company should find itself unable to procure the funds to care for this growth, it will have more than 6,000 telephones in service in its Saginaw exchange within a year, Mr. Serviss states.

The company's plant at Bay City has recently been rebuilt and remodeled and modern, up-to-date equipment and apparatus installed. The growth at that exchange is said to be at the rate of about 100 telephones per month. Over 12 miles of cable, averaging 100 pairs of wires are being put up in the Bay City plant. This will give an added capacity of 1,200 lines. This new work will be contemplated about the first of the year and when done, the Bay City exchange will have a capacity for 5,000 subscribers, or equal to that of the present capacity of the Saginaw plant.

The company plans for an enlargement of the Saginaw plant soon after the first of the year, the limit of the present cable capacity having practically been reached. The company expects to expend $40,000 for new cable work in that exchange almost immediately upon the completion of the work at Bay City. This will give added capacity to the Saginaw plant for 2,000 subscribers. This is greatly needed, Mr. Serviss states, as in some sections of the city the company is unable to install any more telephones on account of its congested condition.

President Clyde O. Trask, says that this has been the most prosperous year the Valley Home company has ever had since it was organized and began doing business on a paying basis. For a period of five and one-half years it paid dividends at the rate of 8 per cent. per annum. It was then thought best by its directors to reduce the dividends to 6 per cent. per annum, and this was done in the spring of 1904. Dividends at this rate have been paid since that time.

Great Eastern Telephone Application for New York City.

The Bureau of Franchises of the Board of Estimate and Apportionment of the city of New York is still investigating the application for a franchise made by the Great Eastern Telephone Co. to do business in New York City. The bureau's investigation extends into the rate proposals, engineering details and financial position of the Great Eastern Telephone Co.

In asking that it be given further time to investigate, the Bureau of Franchises states that since filing its application the company has submitted various descriptive pamphlets and circulars with reference to the system which is proposed to be installed.

Commission's Experts File Results of Lima Appraisal.

The telephone experts of the Ohio Public Utiliteis Commission, on November 18, filed with the commission the results of their appraisal of the plant of the Lima Telephone & Telegraph Co., of Lima, showing totals about 10 per cent. less than the figures of the company. The appraisement was made by order of the commission after a hearing on April 20 of this year, asked by the city council on the ground that the proposed new scale of rates was excessive.

The cost to replace with new material the present plant, according to the figures of the company, would be $904,727, while the public utilities commission figured this "reproduction" value at $818,651, a difference of $86,076. After allowing for depreciation, the company estimated the present value of the plant at $770,640, while the commission figured this at $696,921, a difference of $73,719.

Valuations of Cleveland Telephone Co., of Cleveland, Ohio.

The Ohio Public Utilities Commission recently made public its estimate of the present and reproduction values of the Cleveland (Ohio) Telephone Co., upon which task it has been engaged for more than a year. The present value of the plant the commission places at $6,924,107 and its estimate of the reproduction value at $7,403,729. The company's estimate of the present value is $8,238,869, $1,314,762 more than that of the commission and its estimate of the reproduction value, $8,689,276, which is $1,285,547 larger than the commission's figures.

New Franchise Proposed by Paducah Home Company.

The city commission of Paducah, Ky., is considering a 20-year telephone franchise which has been recommended by a committee for passage at the request of the Paducah Home Telephone & Telegraph Co. It is said that it is identical in every way to the franchise which was recently sold to the Cumberland Telephone & Telegraph Co. This new franchise is sought by the Paducah Home company in order to protect itself against competition. The Cumberland company and the city, as reported in a previous issue of TELEPHONY, recently ended a controversy of many years standing and the franchise sold to the Cumberland company gave it certain advantages over the Paducah Home which the new franchise would equalize.

Bell Proposes to Compromise Litigation at Frankfort, Ky.

A proposition by which the litigation pending between the city of Frankfort, Ky., and the Cumberland Telephone & Telegraph Co. would be dismissed, in consideration of agreement by the city that rates be increased and that the company install a central energy system, bury wires in principal streets, etc., is being debated by the city council, before which the proposition was made recently.

In connection with installation of the improved service the company proposes to increase rates, 75 cents a month on business direct lines, and 35 cents a month on direct residence lines, which would mean an increase on the business service of from $31 to $42 a year. The council received the proposal and one or another of its members is interviewing the Cumberland subscribers on the company's proposal that it would show that two-thirds of them would approve of a proposal to increase the rates in order to obtain better service, the councilmen accompanying representatives of the company.

The Frankfort Home Telephone Co., which is stronger in the city, though not quite as strong in the county outside of the city, now supplies a common battery service. Its rates are on a basis of $30 a year for direct business lines. Some time ago the Home company asked permission to increase rates and the city denied its consent. Some strenuous objections are being voiced to the projected program of the Cumberland company, which has, with its predecessors, been serving Frankfort for 35 years.

Extension of Lines Into Territory of Eastern Wisconsin.

In the issue of November 13 an item was published relative to the case of the Eastern Wisconsin Telephone Co., of Chilton, Wis., vs. the Fond du Lac Rural Telephone Co. The facts in the case, briefly stated, are as follows:

In the fall of 1913 the Fond du Lac Rural company sought to extend its lines into the territory served by the Eastern Wisconsin company, namely, in the town of Taycheedah, Fond du Lac county. The Eastern Wisconsin company filed its objections with the railroad commission and accordingly a

hearing was held by the commission on December 30, 1913, in the city of Fond du Lac.

Under date of January 5, 1914, the commission issued its decision to the effect that the Fond du Lac Rural Telephone Co. must not build or extend its proposed lines into the territory of the Eastern Wisconsin Telephone Co. The Fond du Lac Rural company, however, it seemed, disregarded this order and purchased a small existing line within the prohibited territory and extended the same farther into the Eastern Wisconsin company's territory.

Under date of February 19, 1915, the commission held another hearing at Fond du Lac in which it was shown that the Fond du Lac Rural Company had actually violated the order of the commission as of January 5, 1913. On April 2, 1915, an agreement was reached between the Eastern Wisconsin Telephone Co. and the Fond du Lac Rural Telephone Co. in which the former agreed to withdraw from the prohibited territory, and allowing part of its line, not actually in competition with the Eastern Wisconsin company to remain.

This agreement having been filed with the railroad commission the case was striken from its calender.

Denies Injunction Against Iowa Telephone Co.

The Iowa supreme court recently affirmed the decision of Judge J. L. Kamrar in the Webster county district court refusing the city of Fort Dodge an injunction to prevent the Iowa Telephone Co. from charging higher rates that its franchise provides. The court held that the city of Fort Dodge is amply protected at the present time.

Summary of State Commission Hearings and Rulings.

IDAHO.

November 20: Complaint filed by J. H. Wake against the service of the Cassia Independent Telephone Co. in the town of Elba, Idaho.

ILLINOIS.

November 30: People's Telephone & Telegraph Co.'s application for authority to increase rates at Petersburg, Athens, Oakford and Tallulla, heard.

November 30: Hearing on application of the Commercial Telephone & Telegraph Co., of Olney, for order authorizing the issue of its first mortgage 21-year coupon gold bonds in the aggregate amount of $375,000.

December 1: Hearing on application of the Astoria Telephone Exchange for authority to increase rates at Astoria.

December 1: Hearing on application of the Gillespie Home Telephone Co. for authority to increase telephone rates at Benld.

December 1: Hearing on joint application of the Noble Mutual Telephone Co. and the People's Telephone Co. of Southern Illinois for authority to make physical connections of companies between Noble and Clay City.

INDIANA.

November 18: Petition filed by the Citizens' Telephone Co., of Kokomo, Ind., for an increase in rates. The new rates petitioned for are as follows: Business telephones, $3 a month instead of $2; residence telephones, $1.75 a month instead of $1.50; residence party line telephones, $1.25 a month instead of $1 a month, as at present.

December 20: Postponed hearing of complaints of subscribers of the Citizens Telephone Co., of Columbus, Ind.

KANSAS.

December 9: Postponed hearing on the case of the Reading (Kan.) Mutual Telephone Co. vs. the Emporia (Kan.) Telephone Co. and W. W. Finney, its president. Case No. 945.

December 9: Postponed hearing on the case of the Emporia (Kan.) Telephone Co. vs. the Reading (Kan.) Telephone Co. Case No. 985.

December 9: Postponed hearing on the application of the Emporia (Kan.) Telephone Co. for permission to increase its rates on desk sets. Case No. 1116.

MASSACHUSETTS.

November 24: Hearing held upon a proposed increase in joint telephone and telegraph rates by the Western Union Telegraph Co. and the New England Telephone & Telegraph Co. in the towns of Grafton, Pepperell and Granville. After hearing the testimony, the commission dismissed the case without prejudice, preferring to take up the broader phases of the entire matter within its jurisdiction to acting upon a few isolated cases which might serve as precedents in other communities where difference in conditions warranted different action.

MISSOURI.

November 17: Hearing on complaint filed by J. F. Davidson, J. P. Hinton and the Hannibal Trust Co., of Hannibal, Mo., against the Southwestern Telegraph & Telephone Co. The complainants are endeavoring to secure an order from the commission to compel the telephone company to continue telephone service to them under contracts entered into with the former Bluff City Telephone Co. in June, 1911. These contracts were to be in force for a period of ten years from June, 1911. Subsequent to the agreement the Bluff City company sold its holding to the Southwestern company, which contends that the contracts are invalid because they are discriminatory.

November 18: Hearing on complaints filed by L. E. Brook, complainant, against L. Scrivner, defendant, and L. Scrivner, complainant, and L. E. Brook, defendant. The complainants in both cases operate telephone plants in Brighton, Polk county.

December 1: Hearing on application filed by the Kansas City Southern Railway asking that the commission adopt uniform rules and regulations governing the construction and maintenance of poles, wires, cables, signal and other circuits of similar character of telephone, telegraph and railroad companies over the rights-of-way, tracks and lines of wires of railroad corporations in the state. Case No. 796.

NEBRASKA.

November: The Douglas Telephone Co., of Douglas, Neb., withdrew its petition for permission to increase its switching charges from 30 to 50 cents.

November 23: Hearing on the joint application of the Nebraska Telephone Co. and the Platte County Telephone Co. for an order granting the Nebraska company permission to sell its plant at Columbus, Neb., to the Platte County company. In the event that the commission sanctions the sale, the Platte County company asks permission to raise the rate for business service $1 and to increase all other service rates 25 cents.

NEW YORK.

November 23: Final argument heard in the pending rate case against the Mountain Home Telephone Co. The complainants, the board of trade of the village of Malone, patrons of the Chateaugay and Burke exchanges and St. Lawrence County Pomona Grange, allege unsatisfactory service and unreasonably high rates. Both sides were given one week within which to file answers to the briefs submitted at this hearing.

NORTH DAKOTA.

December 6: Hearing on application of the Berthold Farmers' Telephone Co. for physical connection with the Northern Telephone Co., of Minot, N. D.

OHIO.

November: The commission announced its estimate of the present value of the Cleveland Telephone Co. at $6,924,107 as against the company's figures of $8,238,869. The reproduction value the commission placed at $7,403,729, while the company estimates this at $8,689,276.

November 18: The commission's telephone experts filed with the commission the results of their appraisal of the plant of the Lima Telephone & Telegraph Co. The present value is placed at $696,921, compared with the company's figures of $770,640, while the reproduction value is figured at $818,651, as against the company's estimate of $904,727.

November 26: Application filed by the Hudson Telephone Co., of Hudson, Ohio, for permission to issue and sell $25,000 additional stock for the purpose of retiring outstanding bonds and securing funds with which to make needed extensions.

December 1: David R. Forgan, Edgar S. Bloom and Frank F. Fowle, receivers for the Central Union Telephone Co. authorized to acquire, in settlement and discharge of certain indebtedness for material and equipment furnished, $12,300, par value, of the common stock of the Middletown Telephone Co., of Middletown, Ohio.

OREGON.

November 17: The commission granted the Pacific Telephone & Telegraph Co. permission to discontinue its exchange at Jordan, in Linn county. The town will be served by farmers' lines connecting with the Scio Mutual Telephone Co.

WISCONSIN.

November 24: The commission granted the application of William Collins, who lives five miles west of Madison, to compel the Wisconsin Telephone Co. to furnish him service. The Mt. Vernon Telephone Co. came within 20 rods of his farm and the Wisconsin company within half a mile. Had he connected with the Mt. Vernon line he would have had to pay toll charges of 15 cents to talk with Madison, where he has many customers on a milk route. The commission found that convenience and necessity required that the Wisconsin company furnish him service through the Madison exchange.

November 24: The commission ordered the Superior Rural Telephone Co. to extend service to Clarence Carroll and further ordered the company to desist from the practice of compelling applicants for service to take stock.

Fundamental Principles of the Telephone Business

A Reading Course Designed to Present Logically the Principles Which Underlie Successful Organization and Operation of Telephone Properties—Prepared Under the General Supervision of Stanley R. Edwards—Part I, Telephone Economics, by James H. Shoemaker, Completed June 26, 1915—Part II, The Corporate Telephone Organization, by J. C. Kelsey and S. R. Edwards, Completed September 25 Part III, Telephone Accounting and Auditing, Written by James H. Shoemaker

Quiz Questions on the Preceding Installment.

61. How is one company's income from subscribers distributed upon a dollar basis? Why is it stated that the company has only earned a fair profit?

62. What possibility is involved when it is necessary to use expensive methods in obtaining payments for service from subscribers?

63. How have utility commissions aided companies in making collections?

64. What were the effects of easy-going collection methods of one company?

65. State the benefits derived from having payments made at the office on or before the tenth of the month.

66. Outline the method used by one company in collecting from delinquent subscribers.

67. What means are used to designate bills past due?

68. Outline a satisfactory method of handling subscribers' accounts. What types of subscribers' ledgers should be used?

69. How are toll tickets handled? What entries are made in the subscribers' ledger?

CHAPTER VI. Work and Materials.

70. *Difficulties Encountered in Telephone Accounting.*—A telephone managers' discussion of uniform accounting was mentioned in Chapter I. The author was permitted to ask of the men who participated in that discussion, the following question:

"What one or two things would be most helpful to the men of the average-sized companies in a reading course on telephone accounting?"

"Tell the readers that they must have a system of collections that will bring the money to the company's office promptly, for nothing else can be done to keep subscribers' accounts satisfactorily if collections are not prompt," said the manager who was first to reply. That suggestion has already been met in the sections which deal with revenue accounting.

"Invent and make plain the simplest possible form of 'Work Report' blank, and the simplest possible form of 'Material Used' blank," suggested another manager. This latter suggestion belongs with the details of "Operating Expense Accounting," and it will be dealt with here.

71. *Separation of Time and Material Accounts.*—It is perfectly natural for everybody to long for a blank form that will do the work of separating *time and material used for operation* from *time and material used for construction* (new plant or equipment). But no one has ever been able to satisfy that longing. When a man must jump back and forth, during a single day, from repairs to construction, and from construction to repairs, it is just as necessary to make a separate item of every such change, and of the material used in every such case, as it is to make a separate toll ticket for every "talk." If one wants to see how the blank forms are

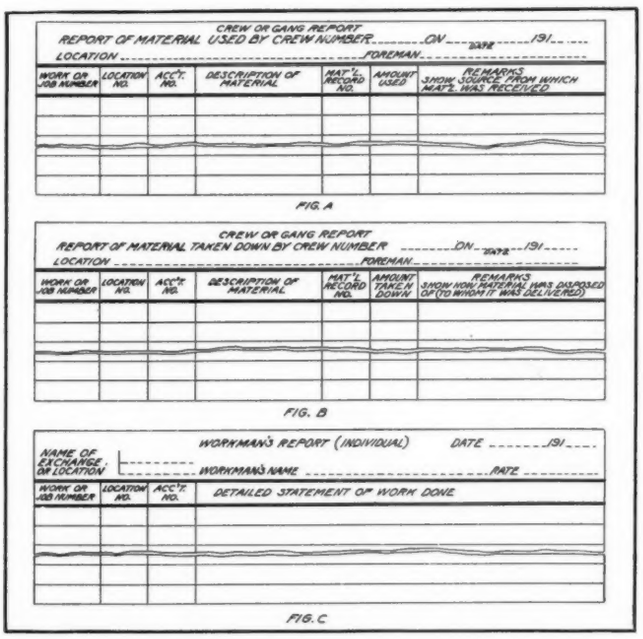

CREW OR GANG REPORT
REPORT OF MATERIAL USED BY CREW NUMBER ..... ON ..... DATE ..... 191....
LOCATION ..... FOREMAN .....
WORK OR JOB NUMBER
LOCATION NO.
ACC'T. NO.
DESCRIPTION OF MATERIAL
MAT'L. RECORD NO.
AMOUNT USED
REMARKS (SHOW SOURCE FROM WHICH MAT'L WAS RECEIVED)
FIG. A
CREW OR GANG REPORT
REPORT OF MATERIAL TAKEN DOWN BY CREW NUMBER ..... ON ..... DATE ..... 191.....
LOCATION ..... FOREMAN .....
WORK OR JOB NUMBER
LOCATION NO.
ACC'T. NO.
DESCRIPTION OF MATERIAL
MAT'L. RECORD NO.
AMOUNT TAKEN DOWN
REMARKS (SHOW HOW MATERIAL WAS DISPOSED OF (TO WHOM IT WAS DELIVERED))
FIG. B
NAME OF EXCHANGE OR LOCATION .....
WORKMAN'S REPORT (INDIVIDUAL) DATE ..... 191....
WORKMAN'S NAME ..... RATE .....
WORK OR JOB NUMBER
LOCATION NO.
ACC'T. NO.
DETAILED STATEMENT OF WORK DONE
FIG. C

Fig. 6. Material Reports and Individual Workman's Reports.

arranged to best advantage where this sort of changing—from one kind of a job to another—is most frequent, let him obtain some forms that are used in certain job printing offices.

The printers have the minutes of the day chronologically spaced, in lines of six minutes (one-tenth of an hour) to the line. Then, across the top of the sheet are headings for the horizontal columns, showing as nearly as possible every kind of work that any printer may have to do. There are columns headed "Miscellanous" and "Remarks" for entering the number of minutes devoted to anything not definitely provided for in the other columns. Every six-minute period of the day is thus definitely accounted for by every man drawing pay. And, these figures are the basis of the "wages paid" and the "unit costs."

72. *Forms for Work and Material Reports.*—In the average company, the work is not so diversified as to require a blank time report of the kind used by printers. Some companies whose records are sufficiently accurate and minute to win the approval of the federal and state commissions get along with forms of work reports more or less similar to the sample

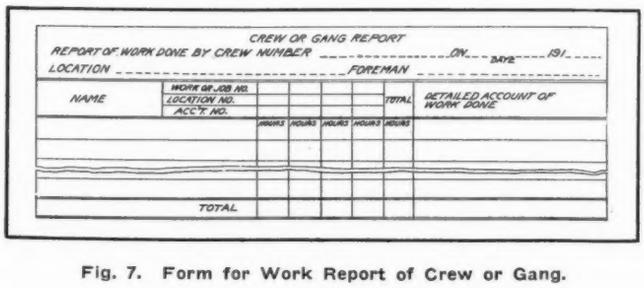
blanks shown in Figs. 6 and 7. It should be understood, of course, that the size and shape of these reports can be varied to suit the company using them. The "Workman's Report (Individual)", Fig. 6-*C*, is often made about as large as a long envelope and of cardboard.

73. *Instructions for Using Work Reports.*—In connection with the filling out of the "Material Work Reports" (Figs. 6 and 7), these instructions apply:

1. The same care must be used in reporting material "taken down," or taken out of use (Fig. 6-*B*) as for material used (Fig. 6-*A*). For this material, under "remarks," in addition to showing what is done with each separate item of "taken down" materials, there must be a statement as to whether it is still "usable," merely "scrap" with a junk value, or of "No Value." These three conditions may be designated by abbreviations as follows: Usable "U," Scrap, "S"; and no value "N.V." Use blank, "Report of Material Taken Down," (Fig. 6-*B*) and attach it securely to work report (Fig. 7.) If no material is taken down, attach a blank report.
2. Show what work each man does, on crew report (Fig. 7). For instance:
   Installing . . . . telephones.
   Putting up . . . . drop wires.
   Digging . . . . 5½-foot holes (always showing the numbers as far as possible).
3. Show reference, as complete as possible, as to work or job numbers, location number, etc., both for work report and material report.
4. Show the exact time put in by each man under each separate job, etc.
5. If extra pay is given for overtime, use two lines for each workman's name on the crew report, and show overtime in the second line with a notation in "remarks" column as follows: " . . . . hr. overtime at rate of . . . . per hour."

It will be noted that the form, Fig. 6-*B*, "Report of Material Taken Down," is the same as the form, Fig. 6-*A*, "Report of Material Used," except in name and the heading of the last two columns on the right. The material reports should be printed upon the backs, or reverse sides of the work reports, Figs. 6-*C* and Fig. 7. When printed on the back of the individual workman's report, Fig. 6-*C*, the heading will have to be modified accordingly.

74. *Important Accounting Needs.*—After the close of the convention at which a request was made for simple forms of blanks, the author met a man who handles the records for the operating and construction department of a company which has something like 20 exchanges. This man was asked: "What do you look upon as the most important of all the accounting needs, in the matter of operating expenses and construction expenses?"


CREW OR GANG REPORT

REPORT OF WORK DONE BY CREW NUMBER ____ ON ____ DATE ____ 191__

LOCATION ____ FOREMAN ____

NAME	WORK OR JOB NO. / LOCATION NO. / ACC'T. NO.					TOTAL	DETAILED ACCOUNT OF WORK DONE
		HOURS	HOURS	HOURS	HOURS	HOURS	
	TOTAL						

Fig. 7. Form for Work Report of Crew or Gang.

"Every company," he replied, "should have one person on its accounting force who is thoroughly posted regarding two things:

First, average unit costs.

Second, what really is operation on the one side and what is extension of plant or new equipment on the other."

Then he went on to explain that it was the lack of familiarity concerning these two classes of details, coupled with a dislike for the painstaking work which must be done, that accounts for almost all of the inaccuracies as well as the complaints about expense accounting.

When asked for some of the unit costs which he considered among the more important items, he said: "My experience in this matter may be wholly misleading to a man associated with some other company, located in some other part of the country or working under other conditions."

But, he was willing to give the unit costs which he had secured from the actual work done by his company during a period of four years. It was explained, however, that these costs include every item of "overhead," such as the preliminary estimating, general supervision, subsequent inspection and all that kind of expense which many companies have never "figured in" when arriving at corresponding costs.

75. *Data Obtained from Work Reports.*—"No kind of a report blank would be worth as much to our company," said he, "as this definite and dependable knowledge: Under ordinary working conditions, a working crew or gang—consisting of a foreman, four linemen and two groundmen—should put up 4,000 feet of 25-pair cable (using cable hangers) in a day.

A groundman should dig eighteen 5½-foot post holes, under ordinary conditions, in a day.

A man should 'ring' 15 spans or about 1,700 feet of cable in a day."

76. *Some Unit Costs of One Company.*—The averages for this company's performances in other matters were:

Cost of digging main ditch for underground, including temporary replacement of paving, 23 cents a foot. This was done with labor at $2.50 and teams at $4.50 per day.

Straight splicing of 200-pair cable, $6. And underground cable should be pulled in, ordinarily at a cost of two cents a foot.

Labor cost, including treating, roofing, gaining (but not fitting with cross arms) hauling, etc., for a 25-foot pole, $2.43; for a 30-foot pole, $3.90; for a 35-foot pole, $6.50; for a 40-foot pole, $8; for a 45-foot pole, $10; for a 50-foot pole, $15.

77. *Two Records for Material.*—In accounting for material used, the company, which employs the man here referred to, originally required the workmen to account for every screw separately. For instance when a telephone was installed, the installer had to show in his report of material used, the four screws used to fasten the instrument to the wall. And these four screws had to be carried through all the accounts separately and credited up to the "Screws Account" in the materials and supplies department, exactly as the telephone instrument had to be credited to the number of telephones on hand.

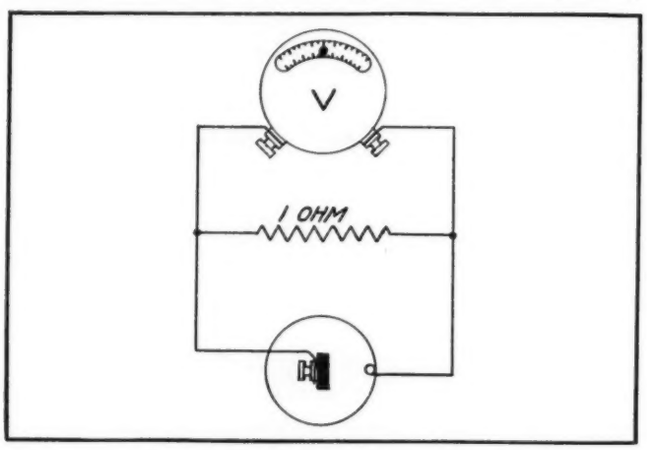
It should be observed, also, that material must be carried through two records. One is the account in which it is treated solely with reference to its "dollars and cents" relationship, and with no recognition of quantity except as a necessary multiplier or multiplicand with which to arrive at a correct cost or value. The other is the *record of "quantity,"* with no recognition of cost.

(To be Continued.)

Practical Subjects—Letters and Discussions

Testing Dry Cells.

The present high price of dry cells prompts us all to economize in their use. The chief method of carrying out this economy by telephone companies is systematic testing and reuse of cells recovered. This testing is usually done with an ammeter. It seems to me, however, that to test a dry cell by



Arrangement for Testing Dry Cells.

placing an ammeter across its terminals is about as sensible as to upset a bucket of water to see how big a wet spot it will make in order to know how much water was in the bucket.

An ammeter is, as we all know, practically a dead short circuit when placed across terminals. Now all one finds out about a dry cell by the use of an ammeter, is the amount of current it is able to send through a short-circuit. This depends on just one thing—the internal resistance of the cell—for the voltage of a dry cell does not depend on its size, shape or condition; only on the kind of material in it.

A zinc-carbon-salammoniac cell gives an e. m. f. of about 1½ volts. A zinc and copper cell will give some other voltage.

If the ammeter reads 30 amperes when connected to a cell, it simply means that the total resistance is 1/20th of an ohm. In like manner, a 15-ampere reading means 1/10th of an ohm resistance; 8-ampere, 3/16ths of an ohm; 5-ampere, 3/10ths of an ohm; and 2-ampere, ¾ths of an ohm.

By placing a known, small resistance in multiple with the voltmeter, we can make the same determinations and never draw more than 1½ amperes from the cell if the resistance is one ohm. With a new cell able to give a short-circuit current of 30 amperes, we would draw 1 3/7 amperes and get a reading of 1 3/7 = 1.43 volts. With an 8-ampere cell, we would get 1.26 volts and draw 1.26 amperes. A 5-ampere cell would read, 1.13 volts and a 2-ampere cell, 0.85 volt.

We could then call a cell new if it read between 1 1/3 and 1½ volts on our modified voltmeter scale. On a reading of 1.25 or less, a cell should be removed from farm line telephones. With a reading of 1.1 the cell would still be useful in the ringing battery, while one giving a reading of less than 0.8 volt would be best removed, no matter where found.

These values, while purely arbitrary, are useful and could be varied according to the use of the cells and the experience and ideas of the user.

In my volt-ammeter, I wound a one-ohm non-inductive coil and mounted it inside the case connecting it in multiple with the voltmeter coil. My volt-ammeter is just as handy as it ever was and I do not short-circuit every cell that I handle.

It is not necessary that the coil be exactly one ohm nor even that one know exactly what its resistance is. With a few comparisons with ammeter readings, one can determine what interpretation to put on the voltmeter readings.

When testing strings of batteries, it is not the greatest possible amperage of the cell we want to know, but the available current. This available current depends as much on the connections as on the cells.

If the testing instrument terminals are placed on the corresponding cell terminals of adjacent cells, not only will the cells be tested but the connections as well, as the battery is gone over cell by cell.

Yutan, Neb. John E. La Mont.

Short Cut in Figuring Traffic Forces.

The volume of telephone traffic fluctuates considerably from season to season, independently of the gradual increase as new stations are added, says W. B. Stephenson in the Southwestern Telephone News. Moreover, the volume of traffic fluctuates during the different periods of the day, from comparatively nothing during the night to a maximum at about 9 o'clock in the morning. In order to give good telephone service it is necessary to have enough trained operators at the switchboard at all times. On the other hand, it would be needless expense to have too many operators.

To have the proper number of trained operators in the organization at all times, it is necessary to estimate the amount of traffic far in advance, and make proper preparations for handling it.

This is done by estimating the number of calls to be received during the busy hour at each office. From special records the percentage of the busy hour traffic that is received during each period of the day is determined. This is obtained by fifteen-minute periods for the largest offices, by half-hourly periods for large offices, where the traffic does not increase or decrease too rapidly, and by hourly periods for the smaller offices. Knowing the estimated busy hour and the percentage each period of the day is of the busy hour estimate, it is then possible to calculate the number of calls during each period.

After determining this number of calls it would be a comparatively easy matter to determine the number of operators required, if an operator could always handle the same load. Such, however, is not the case. The number of calls an operator can handle during the busy hour depends upon her experience, the type of switchboard, the percentage of calls she must trunk to another office, and the class of service of the originating station. By giving the proper weight to the different labor elements involved in the various kinds of calls, the load per operator is determined for the busy hour, but this busy hour load cannot be used throughout the day, as vacating positions increases the amount of switchboard covered per operator, and, as a result reduces the number of calls that can be handled per operator.

The load per operator must be modified for each period of the day in accordance with the relation a particular period bears to the busy hour. For example, each operator cannot handle as many calls at 4 o'clock in the afternoon, when the volume of traffic is less, as she can at 9 o'clock in the morning, when the traffic is at maximum, as there will not be as many operators at the switchboard, and each operator will have to reach farther.

This variation of load during different periods of the day has been carefully studied, and curves have been drawn showing for any given busy hour load the proper operators' load for each percentage of the busy hour. For example, if the proper load at an office is 180 calls during the busy hour, the theoretical load is 155 when calls are coming in at the rate of 50 per cent. of the busy hour and 85 when at 10 per cent. In like manner, with a busy hour load of 150,

the proper load at 50 per cent. is 130; at 10 per cent. the load is 71.

Thus, when working up an organization study for an office, after (1) the estimated number of calls to be received during the busy hour, (2) the percentage of this number that will be received during each period of the day, and (3) the proper busy hour load have been determined, the following operations are necessary for each period of the day to deter mine the requirements:

(1) Multiply number of calls to be received during busy hour by proper percentage, to determine number of calls to be received during that period.

(2) Look up proper theoretical load for the percentage of traffic to be received during the particular period. This involves reading a curve if the busy hour load happens to be an even multiple of ten, or reading two curves and interpolating between them, if busy hour load is not an even multiple of ten.

(3) Divide estimated calls to be received during period obtained in "1" by theoretical load for that period, obtained in "2." The result is the number of operators required.

These operations given in "1," "2" and "3" above must be repeated for each period of the day, both week and Sunday. For a single study for the Main central office in St. Louis, this involves 177 operations, any one of which is liable to error. These operations must be repeated thousands of times annually in preparing studies for the territory.

With the new special organization study slide rule, all three of these operations for each period have been eliminated, and in their place one simple operation has been substituted. After the slide rule has been once adjusted for busy hour traffic and load, the number of operators required for any percentage of the busy hour may be read directly without further adjustment. This not only eliminates two calculations for each period, but also eliminates reading the curves and interpolating between them. By use of these rules it has been possible to extend the scope of organization study work considerably without increasing the expense of preparation.

The Keuffel & Esser Co. has made up these slide rules on regular 20-inch Mannheim blanks. They can also be used for any calculation for which ordinary slide rules are used, in addition to the special organization study calculations. Three are being used with good success in St. Louis.

A Cure for Abuse of Flat Rate Telephone Service.

By Garrison Babcock.

We have a condition and not a theory to deal with in the flat rate telephone schedule. Its inception is supposed to have been due to the fact that the first commercial telephone plant employed two magnetic receivers at business substations and only one receiver at residences. As the telephone companies had to pay a patent license on each instrument, they made a double charge for the business service. The residence subscriber had to reverse the instrument from listening to speaking positions as rapidly as the conversation direction changed and that may have contributed to the lower rate being charged for residence service.

During the 35 odd years since the first commercial telephone plant, both the public and the plant builders have labored under the impression that flat rates are as necessary as the transmitter and receiver. The question of equity as between users is a relatively new one and would in all probability have reposed dormant if the utilities commissions, in their effort to regulate rates, had been content with precedents only. Today, we have several angles to the rate question. As plant valuations are being rapidly established, other questions are arising and must be answered.

Other questions than the pocketbook are interesting the subscribers. They are considering service questions from their own standpoint. They find that some business subscribers originate only two calls per day, while others originate two hundred calls and both pay the same rate. They also find that some stations receive two hundred calls per day and others none at all. They find that they get the busy signal three out of five times when calling some stations. Instead of appreciating this extra burden placed upon the company, they declare the telephone a nuisance. For the moment they forget that the telephone has expanded the scope of human endeavor about 100 per cent.; that the company is a great public benefactor and that the operators are handling more public business than the mail carriers. Under provocation it is easy to forget.

Every telephone manager knows that the most satisfactory solution in the case of a chronic kicker is to bring the subscriber over to the exchange and show the cross-connecting board and terminal room, and then the operating room where one operator is doing her best to serve from 100 to 200 subscribers at one and the same time. Such kickers always go home satisfied that they have learned something and their complaints thereafter are in the nature of information rather than remonstrance.

Combine this situation with the fact that the utility regulating commissioners are elected or given political appointments and we are confronted with the advisability of taking the public into partnership when we want some rate revision—otherwise we are dealing with a balky mule. The only offset is in the fact that nearly all Independent telephone plants are constructed through the sale of stock shares to the public. Sometimes it is possible to influence the public to encourage and co-operate with the stock-holding public. However that is in reality only "business goodwill." It should only be used for goodwill purposes and not as a right for taxation.

It is well known to telephone men that in flat rate plants, 15 per cent. of the subscribers cause or originate 50 per cent. of the traffic load. They know that these heavy users are the hardest to please, and that it is the small user who objects to a raise in rates even when the company shows that it is losing money. It is a two-horned dilemma.

Lines reported "busy" too frequently are the cause of much complaint from a large number of subscribers. It is reasonable that a subscriber's business, which is so important to other subscribers in the system as to involve an overload of incoming business, should not be made a cause for complaints. Therefore it is proposed to give one concession covering incoming overloads, for the good of the service to all, as a consideration and inducement in securing the support of 85 per cent. of the subscribers, for a curative condition for outgoing overloads which will properly increase the companies' revenue.

It is proposed that the following petition be circulated for the signatures of the subscribers, directed to the state public utilities commissions:

"In the interest of improved telephone service and for greater equity as between subscribers, we request that you issue the following orders:

Any subscriber's line which is the recipient of calls at a rate 200 per cent. greater than the average number calls per station of the exchange in which such line is connected and which rate continues for a period of 60 days, excluding legal holidays, shall be designated as an "incoming line," over which the subscriber shall not send "outgoing" messages and for which the utility company shall make no further charge, except for directory listing.

Any flat rate subscriber, whose outgoing calls average, for a period of 30 days, 100 per cent. or more above the average call rate for the exchange in which such line is connected, shall pay a 30 per cent. increase above the flat rate class in which such subscriber is classified, for each 100 per cent. increase above the average number of calls per station of that exchange.

The passage of these orders will involve the company in the maintenance of comparatively few free "incoming lines" for

the good of the service, but at each of these subscribers' stations, the second line will be necessary for outgoing service and will, to a large extent, equalize the free incoming line cost, while the surcharge for overloaded outgoing lines will constitute a distinct profit of considerable importance. The net result will be three-fold: Better service; turning a present loss into a profit; and securing co-operation of the subscribers.

Every telephone man who feels that this proposition would result in ultimate good for his plant and the telephone industry at large, as the writer does, might assist in its rapid development, by addressing a letter setting forth his views to the secretaries of the national associations and thereby secure co-operation in the preparation of a standard form of petition and simultaneous action by all companies interested.

Duties of the Manager of a Small Telephone Exchange

Various Phases of the Telephone Business in Which the Small Exchange Manager Must Become Proficient—A Number of the Most Frequent Faults in the Operation of a Telephone Plant—Some Helpful Suggestions

By B. F. Van Tress

There are in the United States many small and medium-sized telephone exchanges in which an exchange manager is placed in charge of all maintenance and construction work of the exchange. The duties which these exchange managers are called upon to perform cover a wide range. To be successful they must qualify in each of the following lines:

Switchboard man, rack man, battery man, storekeeper, cable foreman, superintendent of construction, wire chief and troubleman, keeping cable and line records, traffic chief and superintendent of collections.

In the large exchanges a man seldom works in more than one or two departments of telephone work, where he is expected to become expert. For one man to become proficient and do first-class work in all branches of telephone work takes years of experience. An exchange manager is very apt to do good work in certain lines where most of his experience has been, and neglect other branches of his work which are just as important. For instance, a man may do first class outside construction work, and neglect the operating and collecting departments; or he may be a good office man, and neglect the construction and trouble departments. The object of this article is to take up in detail the duties of the small exchange manager, as outlined above, with suggestions which may be helpful, and especially covering some of the most frequent faults in the operating of a telephone exchange which have come under the observation of the writer.

It should be the object of every telephone company to give the best service possible for the rates under which they operate. Many of the smaller telephone companies were organized and built with the object of giving cheap service, at rates which put a handicap on their future efforts at improvement. The fact seems to be becoming more generally recognized each year, that the larger the original investment, if put into first-class construction and equipment, the greater the returns in small maintenance charges and improved service.

Every telephone company should have an ideal of a model plant and make every effort to change their ideal into a real model plant in as short a time as possible. Following are some of the matters which demand the attention of the exchange manager if he wishes to operate his exchange as it should be and keep it in condition to give good service.

The Care of the Switchboard.

The care of a small switchboard does not take a great amount of time, but needs constant and prompt attention. Repairing switchboard cords and the cords of operators' sets takes most of the time required for switchboard trouble. In many offices cords are not repaired when they begin to get "noisy," but are left until they refuse to work any longer. Some plan should be adopted for having trouble reported promptly; the operators may be instructed on how to detect and report trouble in the cord circuits, or better, the switchboard repairman should make regular tests of all cords and supervisory signals at least once a week. This work may be done late in the evening or on Sunday when the operating force is small. Some men object to working out of regular hours, but there is no other satisfactory way to do a great deal of switchboard repair work. Enough cords and plugs should be kept on hand and in repair, so that cords may be changed at the board and bad cords repaired in the workshop.

Many men take a spool of thread, scissors, etc., and sit down at the board to do their cord repairing. One inexcusable fault which some men have is the taking of the unused parts of the switchboard for repairs, without replacing them. These parts may be misplaced or lost and cannot be found when needed. The entire equipment of a switchboard and rack whether used or unused, should be kept in working order.

In locating trouble in the cord or line circuits it is necessary for a troubleman to use the blueprints of the circuits until he has learned the circuits. Switchboard trouble cannot be located without intelligent testing and no man who is not a competent workman should be allowed to do switchboard work.

Keeping a cross connecting rack in good condition should be very easy, but an inspection of many racks would indicate the contrary. Following are some of the essential points which should always be observed:

In running jumper wires use a good flameproof wire, without splices.

Use notched pliers, or some tool that will cut the braid and rubber insulation off squarely.

Clean the tips of any surplus solder or old wire.

Solder every connection.

Use system in running jumper wires; that is, run them through the proper rings. Do not pull jumper wires tight.

Clean the dust off all parts of the rack regularly. This is a matter which is generally overlooked and may seem unimportant, but it is an important part in keeping a rack in good condition.

Batteries and Their Care.

In the magneto exchange the gravity battery used on operators' talking sets is a source of much trouble if not given proper attention. These batteries may be kept clean and neat and the solution right only by constant attention and not by neglect. Keep the batteries in a place where they are easy to get at and always in sight, and when they start corroding, attend to them at once. After cleaning see that the connections are tight, the outside and tops of the jars dry, and the surface of the solution covered with crude oil or kerosene, which is much cleaner.

Dry batteries used on pole changers, etc., need to be looked over often to prevent short-circuiting of cells through moisture in the covers of the cells. All cells should be tested regularly and weak cells removed, as they will decrease the efficiency of the set. The appearance of the sets of dry cells may be greatly improved by making the connecting wires up in uni-

form coils and lining up these connecting coils as well as the cells in straight lines. The rules for the care of storage batteries which the manufacturers send out should be carefully studied and followed in detail. The lack of careful handling will soon show up in the condition of storage batteries. In watching the condition of the solution, a man is apt to take all readings from the pilot cell and neglect to test the other cells for long periods at a time, when he should be sure all the time that all cells are in good condition. The overcharge is another matter that is very often overlooked. It is the careful attention to seemingly small but very important details in the care of batteries, as in all other parts of telephone work, that counts.

The quality of neatness and order seems to be wanting in a great many men, as may be seen by the condition of the supplies and material in many storerooms of telephone companies. It takes some work and planning to arrange a workshop and storeroom in systematic order, where material of all kinds has a place where it may easily be found, but it is work that pays well in time saved. Every employe should be shown the importance of each doing his part in keeping order in the store room, and keeping the place clean and orderly.

The construction of cable work should only be undertaken by a competent and experienced cable man, as a well built cable plant will show very little trouble and may be kept in good condition by frequent inspection. This is the work of the exchange manager and should not be neglected.

There are three main causes for injury to cable:

First. Injury to the sheath by contact with some obstruction such as trees, cross arms or cross arm braces. This kind of trouble may be prevented by inspection.

Second. Crystallization of the sheath, which cannot be prevented but may be repaired before the wire is injured.

Third, Lightning, or high tension trouble. This also is unavoidable, but makes it necessary to see that the cable is properly protected by fuse and arrester.

The entire cable plant should be inspected at least twice a year and troublemen should always be on the lookout for bad spots in the cable which should be reported at once. It is a poor policy to tape up a hole or cover it with some temporary covering and leave it indefinitely. Permanent repairs should be made as soon as possible. Prevention is the best treatment of cable trouble.

Line Construction.

Line work is the big item in the work of the small exchange manager during the summer months, and the pressure of this work is liable to interfere with his giving proper attention to many other duties for which he is responsible. It is generally a difficult matter to get a competent foreman on a small exchange where a crew of linemen is employed but a part of the year. Most managers realize the importance of getting good line construction work done, and when the services of a good foreman cannot be secured, feel the need of giving much of their time to this work, even though they must neglect other work to do it. The class of pole line construction has greatly improved in the past few years among the smaller Independent companies. The experimental period is past and new construction must be substantial, built to last for long periods of time.

A manager should visit other telephone plants as often as possible and study other managers' methods, as many ideas for the improvement of his own work may be gained in this way. In order to keep up to date one must be improving the methods of performing his work all the time.

The use of small poles has been one of the weakest points in the construction work of most Independent companies. Heavy poles mean a pole line which will stand up well and last a long time.

Another matter of poor economy is the use of bare iron wire in towns where the corrosive effect of the atmosphere rusts them out in a few years' time. The remedy for this is a well constructed cable plant with terminals close together and twisted pair insulated wire run to subscribers' buildings. Any lead having more than two cross arms full of wires should be replaced by cable. While the original cost of cable is higher the smaller maintenance charges and longer life of the cable make it a good investment.

It matters not what other important work a manager may have on hand, he must always keep in touch with the trouble department in order to give good service to the subscribers.

In accurately testing out each case of trouble and carefully routing troublemen, much time and expense may be saved. On many small exchanges there is no reliable equipment for testing trouble and the operator is depended upon to test out and guess at the trouble. While this method has proven satisfactory in the past, the progress of the industry has brought us to a time when such methods are inexcusable. The small exchange may be equipped with reliable testing circuits at comparatively small cost, so that the condition of all circuits in the plant may be definitely known, and trouble tested and located with some degree of certainty.

There are two important points to consider in trouble work: First. Attend to all trouble at once; do not let the trouble pile up. Second. When the trouble is located, remove the cause of the trouble. See that the same trouble could not occur again.

Keeping the Records.

Every telephone exchange should have a cable record which will show at a glance where to find either end of every cable pair, as well as lines to which each working pair is connected. There should also be a line record showing the cable pair and pin numbers of every circuit in the exchange. To be of most value these records must be kept corrected up to date. Changes should be made in the records at the time the work is done outside. The best system in the records which the writer has seen for small exchange use includes a pocket line book for linemen's use, showing the line number, position on the rack, cable and terminal pairs, pen numbers and subscribers' names; second, a cable record on stiff cardboard about 12 by 14 ins., each sheet showing 50 pairs of cable, left hand side showing office ends and on opposite side showing the terminals at which each pair cuts out, also showing lines for which each pair is used.

A circuit diagram on the same sized cardboard is also included, one sheet for each lead from a terminal, showing pin position and line number on left hand side, then each circuit shown by a dotted line. Poles are also shown and cross streets indicated. Each drop may be shown by telephone number at the pole to which the drop runs. This chart is useful when looking up connections for new installations, as it shows the actual condition of the lead at a glance.

A blueprint pole line map of the exchange is also a very useful part of the records of a telephone system. The standard practice of many companies is to make these prints of city plants on a scale of 200 to the inch. On country exchanges a print may be made covering the whole exchange on a scale of six to eight inches to the mile. These prints can be made to show all poles, with height of pole and number of cross arms if desired, also all cable and terminals and much other information.

One of the greatest needs in rural telephone work is in the traffic department, in the adoption of uniform and standard methods of operating. This is not an easy matter for the average manager in a small exchange. The careless methods of operating and lack of proper training in standard methods of handling calls are hard to overcome. It takes long and persistent effort to bring up the standard of service in an office where no attention has been given to training operators in proper methods of performing their duties.

The greatest help in this matter is the school or institute where operators may have the benefit of instruction and train-

ing by experts in traffic work. Very helpful books and pamphlets may be secured on uniform methods of operating, but the first and most important step in this work is to create the desire on the part of the operators for improving their efficiency. Operators' meetings for talking over ways in which the service may be improved are one of the greatest helps in this work. This may be followed up by making service tests. These tests should be made from subscribers' telephones and each operator should be given a number of calls, and the following items noted on a form arranged for the purpose:

Numer of seconds until the operator answers.

Phrase used in answering, and tone of voice.

Does the operator repeat the number given her?

On magneto exchange, does the operator come back on the line?

Length of time taken to get the operator back for a second call.

The results of these tests may be given to the operators, as it will be a credit to them if doing good work and a stimulation if they are not doing good work. The manager should not be satisfied until the work of his office is conducted in as systematic and uniform a manner as this work is done in the large and well conducted offices.

COLLECTIONS.

The proper methods of handling collections is a matter which needs considerable thought and tact. It takes unceasing efforts to keep up small accounts of a large number of subscribers but success in this department means a great deal to any telephone company. A man must be on the job all the time to prevent the uncollectible accounts from piling up and cutting down the profits of the business.

There should be an established method of collecting, which is thoroughly understood by all subscribers, and this method should always be carried out. For instance, a regular time should be fixed for sending out statements for rentals due, or for a collector to call, and a fixed time when service will be cut off. This program should then be followed out unless there is a very good reason for making an exception. Promptness and regularity in the collection of accounts should be a company's aim.

All of these subjects which have been discussed come up in the work of the small exchange manager, and each one of them deserves careful thought and study on the part of the manager who wishes to be successful in all phases of his work. To be successful in telephone work a man must be ambitious; he must have energy and force to push things, and not allow his work to pull him along; he must be progressive, always improving by study and observation, and not settle down, self-satisfied, with the idea that his work is good enough.

The great work of the managers of the many small telephone exchanges is not simply to run the exchange and furnish service, but to raise the standard of work in all departments of the industry, and make the telephone industry a substantial and well conducted one, furnishing only first-class service.

Bulletin on Tentative Standards of Telephone Transmission.

The Independent Telephone Association of America has published a bulletin on "Tentative Standards of Telephonic Transmission," as applied to central office and subscriber station equipment. This bulletin has been drawn up as a result of the work of the standardization committee which was appointed at the Minneapolis convention of the Independent association, last January.

The bulletin takes up standards for central battery switchboards, standards for local battery switchboards, standards for long distance switchboard equipment and losses in subscriber station equipment.

These tentative standards will come up for discussion at the Friday morning session of the joint convention of the Independent Telephone Association of America and the National Independent Telephone Association, next week. At that session the necessity of standardization will first be taken up; second, the work of the standardization committee of the Independent association; third, what the adoption of the standards means to the operating companies; fourth, what the adoption of the standards means to telephone manufacturers and, fifth, what the adoption of these standards means to the entire field of telephony.

Suit to Compel Connection With Private System.

James Bingham, former attorney-general of Indiana, has filed a suit in the Marion county circuit court against the Central Union Telephone Co., for the purpose of compelling it to connect with his private intercommunicating telephone system in the Bingham suite of offices. The case has been set for hearing.

Mr. Bingham states that the intercommunicating system in the offices is owned by himself and was installed at his expense. The company, he alleged, threatened to discontinue service at the office unless he discontinued his private office system. Mr. Bingham was able to show the court that there was immediate need for a temporary restraining order, which was granted.

Company Must Furnish Service to Applicant.

Wisconsin Railroad Commission, on November 24, granted the application of William Collins, who lives five miles west of Madison, to compel the Wisconsin Telephone Co. to furnish him service. The Mt. Vernon Telephone Co. came within 20 rods of his farm and the Wisconsin Telephone Co. within half a mile.

Had he connected with the Mt. Vernon line he would have had to pay toll charges of 15 cents a call to talk with Madison, where he has many customers on a milk route. The commission found that convenience and necessity requires that the Wisconsin Telephone Co. furnish him service through the Madison exchange.

Earnings of Ohio State Telephone Co. for October.

The gross revenue of the Ohio State Telephone Co., Columbus, for October was $278,125, compared with $250,236 for the same month a year ago, and $275,652 for September, this year.

The expenses totaled $161,751, compared with $165,138 a year ago. The net income was $116,373, as against $85,138 for the month a year ago. Net earnings footed $69,889 and for October, 1914, $43,665. The balance available for depreciation, common stock dividends, etc., amounted to $43,801, against $18,296 last year.

Kansas Independents to Hold Convention in February.

At a meeting of the executive committee of the Kansas Independent Telephone Association, held recently, it was decided to hold the annual convention of the association in Topeka, Kan., on February 15, 16 and 17, 1916. Further particulars regarding the convention will be announced later.

Banquet for P. B. X. Operators in St. Paul.

About 150 private branch exchange operators in the business district of St. Paul, Minn., were entertained recently by the Tri-State Telephone & Telegraph Co. at a dinner and dance. This was the second annual dinner given by the Tri-State company for the P. B. X. operators.

Keystone Telephone Men Hold Banquet.

The "Keystone Pioneers' Association" held its annual banquet recently at Hotel Majestic, Philadelphia, Pa. This association consists of 85 employes who have been with the Keystone Telephone Co. since its formation in 1902.

From Factory and Salesroom

Conventions: Joint Convention of National Associations, Chicago, Dec. 8-10; South Dakota, Sioux Falls, Dec. 15-16; Minnesota, Minneapolis, Jan. 25-26; Wisconsin, Madison, Feb. 9-11; Kansas, Topeka, Feb. 15-17

A Trip Through the New Orleans District.

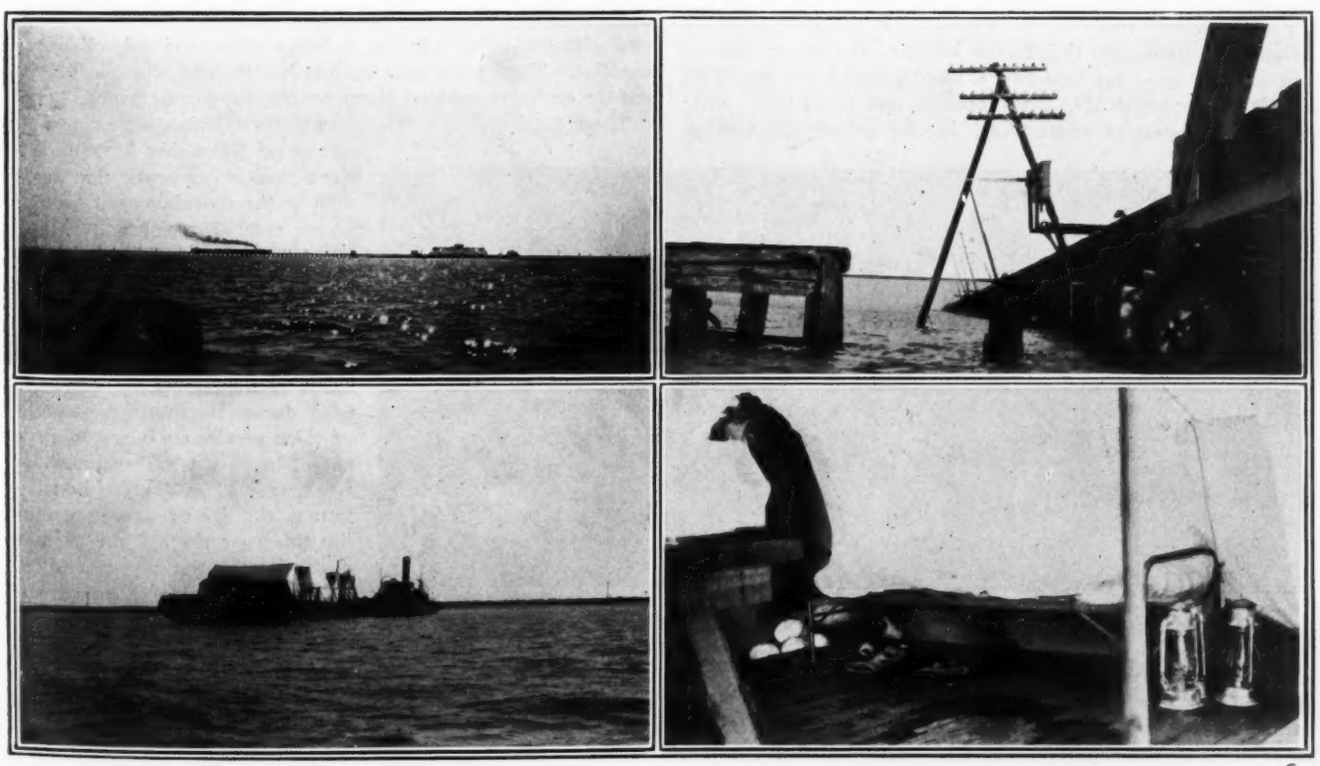
The latter part of October, Claude L. Matthews, vice-president of W. N. Matthews & Brother, St. Louis, Mo., made a trip through the New Orleans district at the suggestion of the engineering department of the Postal Telegraph-Cable Co., in New York. The Postal company had ordered 200 Matthews guy anchors to storm-guy its pole line from New Orleans to Gulfport, which had been very badly damaged in the hurricane which struck that section on September 29, and reconstruction work was then in progress.

On the way down, Mr. Matthews said, he noticed between Hammond, La., and New Orleans, a new, creosoted pole line of the Western Union Telegraph Co. on the left-hand side of the track going south. On the right-hand side of the track was the line of the Cumberland Telephone & Telegraph Co., which was almost completely demolished. The Western Union lines he found generally intact, excepting here and there where the tidal wave had taken a large accumulation of bath houses, launches, schooners, etc., through the wires and over the poles. A few days later upon meeting J. G. Hilbert, plant superintendent of the Western Union company, at Dallas, Texas, Mr. Matthews learned the reason why this line held, when the one on the other side of the road did not. Mr. Hilbert told him that this line was storm-guyed with Matthews guy anchors all the way from Hammond to Lake Pontchartrain Crossing and that he believed a great deal of it was saved because of this fact.

While in New Orleans Mr. Matthews secured an order from the Cumberland company for a large number of eight-inch Matthews Scrulix anchors for storm-guying the company's toll lines running through the swamp. This company has used a large number of Matthews anchors in the past and its experience, it is said, has been much the same as that of the Western Union, namely, that the anchors hold in the swamp provided a hurricane does not try to force a lot of cottages, bath houses, launches, skiffs and even schooners through the pole line with a pressure of 120 miles an hour back of them.

Interior of Barge Showing 200 Matthews Anchors on Either Side.

The Matthews anchors, it is said, can be screwed down in places where it is practically impossible to get any other kind of anchorage because of existing conditions.



N. O. & N. E. Trestle Across Lake Pontchartrain.—Barge and Tug with Camp Outfit.—Interior of One of the Tents.

Mr. Matthews, in company with B. S. Price, plant superintendent of the Postal company, at New Orleans, La., started out early one morning to inspect the "swamp lines." They arrived at Slidell, La., about 9 o'clock where they secured a fast launch. They sped along at the rate of 18

Line Reconstructed and Storm-Guyed with Matthews Anchors.

miles an hour in this launch, through the winding sluggish river and into Lake Pontchartrain.

About ten miles from Slidell, Mr. Matthews said, they sighted the New Orleans & Northwestern Railroad Co.'s trestle across Lake Pontchartrain, shown in one of the group illustrations. As they went under this trestle Mr. Matthews snapped the photograph showing the reconstruction of the Cumberland company's line. The storm blew all of the line into the lake, and, as will be noted in the illustration, the poles are in position but the wires are not strung. Above five miles from this trestle they came to the Rigoletts Lighthouse and the cable crossing of the Postal company. One of the illustrations shows the end of the Postal line coming into the point where the cable crosses under the Rigoletts. This is the line that was to be reconstructed and storm-guyed by means of Matthews guy anchors.

Learning from the lighthouse keeper that the construction gang was about two and a half miles down the lake, Mr. Matthews and Mr. Price started out to find it. One of the photographs reproduced in the group illustration

International Trucks Used by the Southwest Telegraph & Telephone Co. in Dallas.

was taken as they were approaching the barge and tug on which the camp outfit was placed. Another view in the same group shows the interior of one corner of the tents where the workmen sleep. It will be noted that the cots are protected by means of a mosquito netting. The mosquitoes in that section of the country, Mr. Matthews says, bite through the backs of the men's coats and it is necessary to wear nets over one's hands and heavy buckskin gauntlets tied down to the wrists and leggings or high-topped boots.

The interior of the barge and the construction material ready for use is shown in another illustration. Two hundred Matthews Scrulix anchors may be seen piled up on either side.

Not being properly dressed for the swamps, Mr. Matthews and Mr. Price were obliged to end their tour of inspection of the "swamp line" without seeing the installation of the anchors.

International Motor Trucks in Telephone Trouble Work.

Telephone companies all over the country are rapidly realizing the economy, in both time and money saved, of the motor truck in clearing trouble, making new installations and in transporting material to be used in new construction work.

In the city of Dallas, Texas, the average number of contract orders handled by the installation forces of the plant department of the Southwestern Telegraph & Telephone Co., totals approximately 3,000. The portion of this contract work within the business district is generally handled by installers on foot. The residence district, however, covers a considerable area and consequently a large amount of ground is covered by the installation forces in the handling of the contract order work outside of the business center.

Previous to November, 1913, this work was handled by two and three-men gangs, using horse-drawn wagons as a means of transportation. This arrangement was generally unsatisfactory, especially during the summer months when horses working under the Texas sun would become fagged after a very short drive.

In November of that year, five International motor trucks were put into service to replace eight horses and wagons. These trucks were of the 1,000-pound capacity, with 20 H. P. two-cylinder, water-cooled motors, double chain drive, equipped with 42 in. by 2 in. solid rubber tires on the front wheels and 42 in. by 2½ in. solid rubber tires on the rear wheels. Each of these International Harvester wagons was equipped with racks for carrying telephone instruments and compartments for ladders and other necessary tools, and for wire and miscellaneous supplies. They were also equipped with tops which could be wholly enclosed, making them practically weatherproof.

These trucks, the Southwestern company states, were placed in service on November 17, 1913, and were used every work day from 7:30 in the morning until 5:30 at night, until November 17, 1914, without the loss of as much as three hours' time for any single truck. During this period these five International wagons were used, over all kinds of roads and in all kinds of weather. They were also used, during the first three months of their service, to a considerable extent at night on maintenance work, as well as days on installation work. The record kept during this year showed the average cost of operation per month for the first truck to be $37.04; for the second truck, $38.23; for the third truck, $36.01; for the fourth truck, $34.96; and for the fifth truck, $35.94. The average mileage for the entire year was 4,336. The average cost per mile, not including depreciation, amounted to approximately 11½ cents.

These trucks are said to be in good condition today and the

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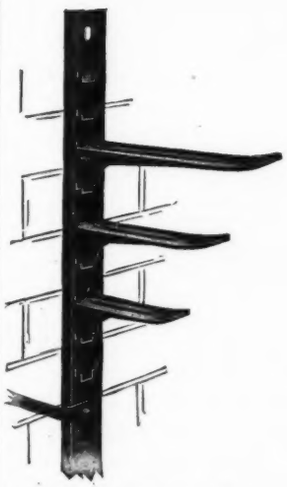

Showing Rack as Used

B & K Pole Line Hardware represents the fruition of the best engineering experience adapted to meet the demands of modern service conditions.

Already it has proved its advantages. No telephone company that desires to make provisions against heavy maintenance and uncertain service and that furthermore wishes to place the burden of the earning power upon its lines, can afford to ignore B & K Pole Line Hardware in its specifications.

Catalogue Free on Request.

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B & K Anchors Complete

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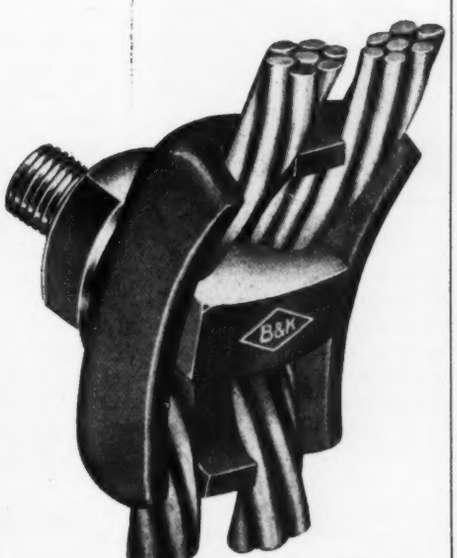
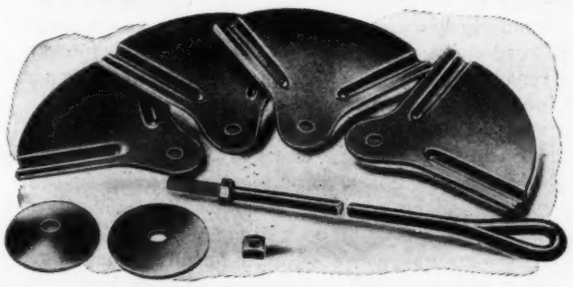
The B & K Line will be on exhibit in room 1736 Hotel LaSalle at the Convention



Showing Method of Handling the Guy Wire



B & K Mushroom Guy Anchor Knocked Down

company expects to get an additional three or four years' service out of them without excessive maintenance charges.

Some time ago the Home Telephone & Telegraph Co., of Santa Barbara, Cal., purchased an International truck. After keeping record for five and one-half months it found that horse and wagon equipment had been losing for the company $119.54 worth of time each month in addition to a higher cost of operation. In a letter to the California representative of the International Harvester Co., A. Schuler, general manager of the Santa Barbara company, says that his first International truck proved so economical that he had no trouble convincing the directors of his company that they could no longer afford to use horses for construction and maintenance work. Consequently the company purchased a second truck and abandoned its other team. In an itemized statement Mr. Schuler shows that the truck effected an average saving of $132.54 per month during the five and one-half months' period in which a strict record was kept.

With a team, he states, on a number of jobs 15 miles out in the country, the men were unable to make the trip and complete the work in one day, necessitating another trip the next day. With the motor truck, however, the same job can be completed in one day, and thus probably save a 30-mile drive the next day.

Further information regarding International motor trucks may be obtained from the International Harvester Co. of America, Harvester Building, Chicago.

John W. Coffey—of Indianapolis.

"A merry soul, in truth, and one of vast experiences."

By Charles S. Norton.

An obituary, be it ever so beautifully written, is entirely worthless to the individual who inspired it. This, then, as the late Elbert Hubbard would have said it, is the obituary of a man who is very much alive. It is frankly written so that he may get some benefit from it, as well as the rest of us—those who would heartily approve of it if he were not present. It is a brief sketch of a man who is still in our midst—and who bids fair to stay until a derrick breaks and drops a safe on him.

John W. Coffey.

"Who is John W. Coffey?" asked a newcomer in the telephone field, the other day.

"Coffey?" returned the man questioned. "I thought everybody knew Jack Coffey. Why, he's the man who put the Indian in Indianapolis."

"Incidentally," he added, as an afterthought, "he knows a few things about accounting, particularly telephone accounting."

But those who know John W. Coffey only as a public utility accounting expert, know only one side of a many-sided man. For Coffey has done many things in his short life. Seemingly he has tackled every new proposition with a rush, much as he goes at everything today—business or pleasure—putting every ounce of his tremendous vitality into it. And the vitality of six feet, four, and 200 odd pounds is *some* vitality.

"He gains wisdom in a happy way," wrote Plautus, "who gains it by another's experience." Jack Coffey hadn't heard of the old Roman when he began his career, and he wouldn't have minded the advice if he had heard it. He went out to get experience for himself. He got his at first hand and he gained a lot of wisdom, thereby, which he has found to be of considerable value to him all along the way.

Much of it has been gathered in the telephone business, in which he has spent the last fifteen years. It has been held by certain enthusiasts that Coffey has forgotten more about telephony than many operators have ever learned. But this is generally conceded to be a bit exaggerated. Coffey doesn't admit it himself—he ought to know. But it is true that he knows the business from stem to gudgeon.

Where the Trouble Began.

Ellettsville, Ind., is a regular town—and Indiana has always been a regular telephone state. It was singularly fitting, therefore, that Coffey, always on the alert to take every legitimate advantage of circumstances, should have selected Ellettsville as his birthplace. That was in 1875.

Shortly after, things began to happen to Ellettsville. But it somehow contrived to worry through several more or less exciting years of Coffey in the cub stage. It still remains on the map, a triumph of civic government in the face of enormous odds.

Before Coffey floated along feet first and hit the telephone business and clung to it, he had done many things. He began young. First, he holds by the value of education. And, instead of fighting, as a lot of us did when we were youngsters, to keep out of school, Jack worked like a Turk to keep in. That is, he worked like a Turk killing Christians—tirelessly and enthusiastically.

Evenings and Saturdays he even cut Ellettsville hair and shaved Ellettsville faces to pay expenses, so he might finish high school. Now barbers' work isn't notably pleasant nor uplifting, nor is it particularly remunerative. And Coffey didn't like it a bit more than you or I would. But it brought him in enough real money to keep him moving and to get him what he wanted—an education—so he stuck. This is fairly illuminative of the things that happened afterward. He set his mark characteristically high, and then he went to it.

The high school course behind him, he surveyed the various fields of activity before and decided that railroading needed a little boost. He concluded to confer a benefit upon the Monon by entering its service. Once enlisted, he began studying railroading. Telegraphy came easy and he soon was an expert railroad telegrapher.

Then the thirst for travel gripped him and he straightway embarked upon the adventurous career of a tramp telegrapher. Back and forth he wandered over several of these United States, holding one position only long enough to exhaust the novelties of the town he happened to decorate for the moment and to get a little stake in hand. Then he gaily waved a farewell to hunt new scenes and dodge new town constables in his off hours, for life has never been tame for Jack Coffey. A wolf for work when work was to be done; he was born for action and excitement as the well known sparks fly upward. And he usually managed to find it. If it wasn't there, he would patiently and painstakingly apply himself to create it.

Railroading from a New Angle.

In the course of his wanderings, the Order of Railway Telegraphers, familiarly known as the O. R. T., became involved in the big railroad strike of 1893-4, and Coffey found his job automatically removed from under him. In order to live one must eat, and in order to eat one must work.

Coffey was no aristocrat. He promptly found work. It wasn't fancy work either. In the course of it he assumed various aliases, for the Coffey name must not become involved in funny doings. When he could, he climbed into jumper and overalls and "broke" freight, or passenger, it didn't matter. When there was no brakeman's job open, he climbed into a cute uniform, two sizes too small and became a "train butcher."

A "train butcher," gentle reader, is one of these case hard-

"Buy Your Insurance at Cost"--25 to 40% saved

THE Utilities Indemnity Exchange offers a plan of reciprocal or inter-insurance for protection against injury claims—**a co-operative movement.**

The purpose of the Utilities Indemnity Exchange is to enable those engaged in operating and constructing telephone plants to protect themselves against injury claims and fire losses at actual cost, thus saving enormous overhead charges and operating expenses of the stock insurance companies.

Do not wait until your insurance expires or until you suffer a loss, but insure now. The Convention would be an appropriate time and place to make a good trial.

Letters recently received Read what they state

Yukon, Okla.,
Nov. 19, 1915.

Mr. Lynton T. Block, Mgr.,
St. Louis, Missouri.

Dear Sir:—

This will acknowledge receipt of your favor of the 16th and voucher for * * * in payment of claim No. 2130 physician's services In Re: P. S. Carroll, injured.

We greatly appreciate the prompt manner in which these claims are handled, and you may be sure, we will co-operate with you in the best way we can to the best advantage for all concerned.

Yours very truly,
W. Winton, Asst. Secy.

Afton, Okla.,
Nov. 20, 1915.

Utilities Indemnity Exchange,
Railway Exchange,
St. Louis, Mo.

In Re: C. C. Snider, C-2068.

Your favor of the 18th inst., enclosing your check for * * * * covering our loss on account of accident to Mr. Snider, received this morning.

To say that we are highly pleased with the manner in which you have handled this claim is stating it mildly. You have done even more than the Workmen's Compensation Law of this State requires. We do not think that any public utility company would make a mistake if they would let you carry their liability risk.

Thanking you for your courtesy and promptness, we are, Very truly,
UNITED TELEPHONE COMPANY.

Mr. Lynton T. Block will be in attendance, Room 1721, at Hotel La Salle during the National Convention

UTILITIES INDEMNITY EXCHANGE

LYNTON T. BLOCK, ATTORNEY AND MANAGER

RAILWAY EXCHANGE BLDG. ST. LOUIS, MO.

ened, utterly shameless individuals who coaxes the bucolic swain to exchange real money, which he needs, for countless worthless articles for which he hasn't the slightest use. And Coffey escaped the extreme penalty for his acts at that. He didn't even go to jail.

Then the strike let up. Coffey resumed his own clothes and his real name and went back to the railroad, this time as relief agent. Instead of relieving people of their money by more or less questionable means, he relieved tired or ailing station agents of their work—until they were able to get back to it.

Soon he was made assistant to the traveling auditor. Then he become train dispatcher at New Albany, Ind. As a dispatcher he made good in his usual way till the unlucky day came, which comes to all dispatchers, when he left his rabbit's foot in his other trousers' pocket. Two trains came together head on.

It was one of those accidents which seems unpreventable by any human caution. Coffey didn't try to beg off. He owned up like a little man. Besides they had the goods on him. But all he got was a 30-day lay-off.

Nobody was seriously hurt in this little run-in. But he began to wonder how he would have felt if eighteen or forty-two people had been sent speeding over the great divide—so he wisely decided to quit railroading with a clean slate.

Telephony Claims Its Man.

So he started in with the Tippecanoe Telephone Co., of Romney, Ind., systematizing its accounts. A year later he was elected general manager—and Coffey was in the telephone business to stay.

He was with the Tippecanoe company four years, all told, when the Crawfordsville Home company coaxed him to fill the general manager's shoes. Coffey filled 'em plumb full for a year and a half, when the New Long Distance company, of Indianapolis, made him chief toll accountant. A year later he was traffic manager for the entire company, then auditor, then general auditor for both the New Long Distance company and the Indianapolis Telephone Co.

He had been with the Indianapolis companies about four years in all when the Indiana Independent Telephone Association created the position of acting secretary. Casting about for the man to fill the job, they picked on Coffey, who at once resigned and devoted himself to the state work.

Soon after this, the question of establishing an adequate toll clearing organization for the Indiana companies came up, and the man selected to organize it, devise its forms, books and methods of operation was—guess! Right again! John W. Coffey. This was about 1910. How well he succeeded is indicated by a letter he received, written after the toll clearing company had been settled on a permanent basis. But we won't quote it here. It's highly commendatory though.

So many Independent telephone companies told him his ideas were sound and his forms effective and simple, that Coffey finally came to believe it himself. Thereupon, after taking counsel with himself and some of his friends, he decided to go into the telephone accounting business for himself. He cut loose all holds, said goodbye to a regular salary and began to make his own canoe whiz through the commercial waters.

He was just fairly started on this wild career when the Illinois Independent association concluded to establish its own state organization for clearing tolls, and Coffey was asked to take charge there. So he tied up to the wharf again for a time, just long enough to set the Illinois clearing house going steadily. They were quite as warm in their recognition of his services as Indiana had been. Then he felt he might properly take up his own paddle again, and he has been at it on his own hook ever since.

Since then his main difficulty seems to have been to take care of the business which came to him. Of course, at times, his old training as "train butcher" came back to him and he goes out after new business as hard as though he really needed it. But that's only his little joke. It really worries him when new accounts come in, because he is too tender hearted to turn anybody away. Hence he and his assistants are constantly working to keep up with the demand for their services. It should be remembered, therefore, that the sure way to start Jack Coffey's Angora doing the one step about the office, is to send him a new account.

Gifts of the High Gods.

While Coffey was still a boisterous youngster, kicking the slats out of his stout oak crib, the high gods got busy and handed him three considerable blessings on a plate. They gave him a big heart, a clear head and a wonderful memory.

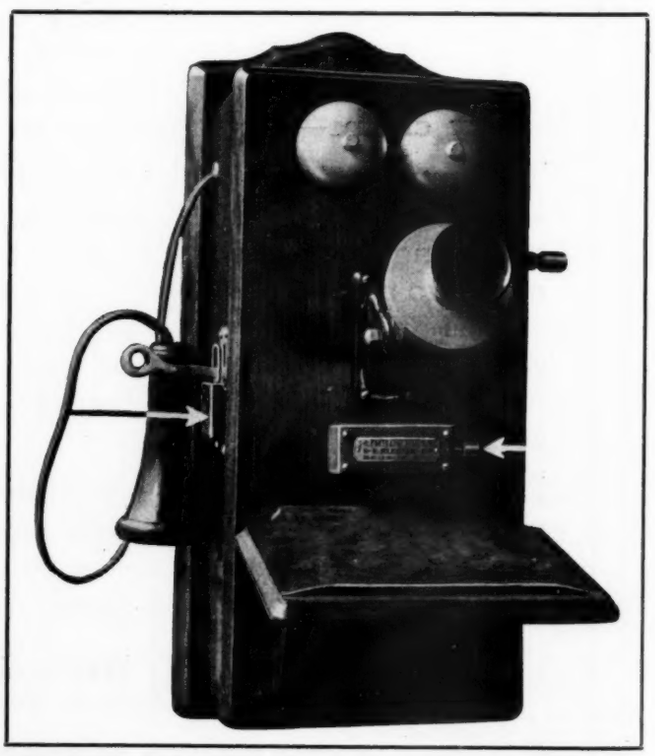
Loyalty to friends and "near-friends" alike is a characteristic which never fails him. He has helped many a friend in need; he has been "touched" by countless "near-friends." The latter should take warning now, however—Jack has grown wiser with the years.

He is an able counsellor in almost any emergency. The clear head which has made his own business successful is and always has been at the service of those who needed it.

His memory for facts and for names and faces is almost uncanny. Perhaps the best illustration of the latter occurred during Taft's administration, when the Marion Club—the big Republican organization, of Indianapolis—entertained the President. The committee in charge of that affair called Coffey in from Iowa for the express purpose of introducing the members to Mr. Taft and seating the guests at the President's table. As there were some 3,000 members, the task was no light one, nor one easily performed. But done it was.

S-R Private Service Attachment for Party Line Telephones

An interesting device for making party lines "non-listening" has been placed on the market by the S-R Electric Co., of Chicago. It is known as the S-R private service attachment and it is claimed that it can be used on any type



Telephone Instrument with S-R Attachment in Actual Use.

of local battery magneto telephone instrument with alternating current. It is intended to be used chiefly on rural party lines with either grounded or metallic circuits. When installed, it is said, it will give the subscribers absolutely secret and intercommunicating service.

The "Alisco" Screw Anchor.

The "Alisco" Ant-Hill Anchor.

ALISCO Anchors

Are Intended for Every Imaginable Kind of Soil

"Alisco" Anchors are furnished in three different styles so that there is at least one design to suit every condition of soil.

The "Alisco" Drive Anchor.

The "Alisco" Screw Anchor is cheaper than a "deadman" and "guy rod." Can be set at less cost than any other anchor. Entirely made of solid open hearth steel. The eye is weldless; the Helix or screw is forged to the shaft—A SOLID ONE-PIECE ANCHOR without any screw connections or parts to loosen. The lower cutting edge is made on an involute curve which is far superior for installation reasons than a radial cutting edge. Guaranteed to stand the A. T. & T. Standard Specification tests.

Dicke Pole Dinkey.

The best DRIVE anchor is an "Alisco." The predominating features are strength, simplicity and economy. Anchor shaft and eye are made of open hearth steel. Two rivet lugs on each of the four wings doubles the strength over wings having but one lug. These wings offer the least possible resistance in driving, but the greatest resistance to pulling power when set. For those who prefer the "Alisco" ANT-HILL type of anchor (and in some cases no other type can be used) we consider it to be the best.

Installing the "Alisco" Screw Anchor. An Easy and Quick Job.

These anchors are not sold as specialties, but as a standard article and at prices which will warrant your investigation. We also manufacture and carry a full line of high-grade LINE CONSTRUCTION TOOLS and will be glad to send you catalogue and prices.

The Dicke Tool Co.

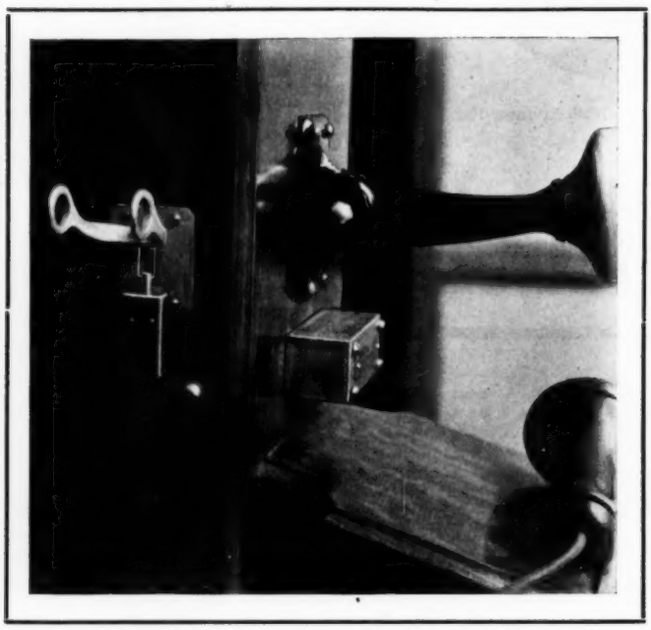
61 Broadway
NEW YORK CITY

=

1290 Old Colony Building,
CHICAGO, ILL.

A Few Blows with a Sledge Installs the "Alisco" Drive Anchor.

This attachment is not a "lock-out" and requires no extra equipment or rewiring at the central office. No relays are used and it is applicable to an unlimited number of subscribers on a circuit. The last instrument on the line should be the ordinary bridging type and no attachment is necessary for it. The only change required on existing lines is to loop in the line wire to the instrument on a grounded circuit, or to loop in one side of a metallic circuit to the instrument on which the attachment is placed. This is clearly shown in the accompanying diagram.



Method of Attaching Selector and Line Restorer.

The S-R private service attachment consists of two parts —the "selector" and the "line restorer." The "selector" is so called because it contains the selecting key which is operated by the subscriber when making a call. It is enclosed in a small case which can be attached to either the side, front, or top of the telephone instrument, by four small wood screws. A ¼-inch hole is made in the instrument under the selector through which the wires are taken inside the telephone and connected according to instructions. The line restorer automatically restores the line circuit to normal when a party is through talking and hangs up the receiver. It is a small device placed directly under the switch hook and is never operated by the subscriber. It does its work regardless of the position in which the selecting key is left.

When two parties are talking on a circuit equipped with S-R attachments, it is said that it is impossible for any other subscriber or for "central" to hear their conversation. Thus when No. 3 rings No. 5, with the usual code ring, a private talking connection is instantly formed upon No. 5 lifting his receiver. Any rings from other parties on the line or from "central" will go through and be received by the nearest talking party. Thus if "central" calls No. 3 while he is talking to No. 5, then No. 3 will hear the ring. Of course, his selecting key is "out" toward No. 5 (to form the talking circuit), but when he hears his ring, he can ask No. 5 to wait while he answers the call. By pushing the selecting key "in" he disconects his talking circuit from No. 5 and connects himself with the calling party. He can tell them that the line is busy and then, by pulling out the selecting key, resume his conversation with No. 5.

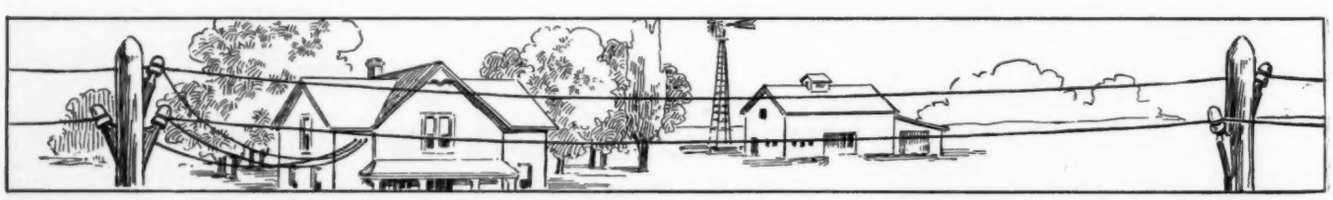
No one except those in actual talking connection can hear these various conversations, it is claimed. If No. 4 lifts his receiver while No. 3 and No. 5 are talking, he thereby disconnects them. At the same time, however, he automatically connects himself with either No. 3 or No. 5, depending upon whether his selecting key is "in" or "out." Thus he knows, of course, that the line is busy, but he cannot listen in, for the connection has been broken. He will therefore hang up his receiver, thereby restoring the talking circuit between No. 3 and No. 5. The line is always restored to normal when the parties hang up their receivers and there is no neutral position for the selecting key.

The S-R system, it is contended, enables all or any number of subscribers on one line, to talk simultaneously and privately, if the connections do not overlap. Thus No. 10 can talk with No. 8 while Nos. 7 and 6 and Nos. 5 and 3 are each carrying on a secret conversation. Furthermore an incoming or outgoing call from or to another circuit, or even a long distance call, can be put through the central switchboard while other conversations are going on over the same circuit, as long as the receiving or calling station is not overlapped by an existing connection.

Since no coils or additional resistance of any kind are added to the circuit and because of the fact that when two parties are talking they are shut out from the rest of the line, it is said that the voice transmission is particularly loud and distinct. On a grounded circuit, for instance, in place of having the induction of the entire line on the talking circuit, as is now the case, the S-R attachments, it is claimed, cut out all induction except the small amount which may exist on the section of the line actually in use. On a metallic circuit there is no ground on the line during the talking connection, thus entirely eliminating all cross talk and other noises. The battery expense which is now caused by subscribers using their transmitter batteries for "rubbering" on the line is also eliminated.

The claim is made that the S-R system permits selective ringing in either direction on the line without the parties on the opposite section of the line hearing the ring. For instance, on a ten-party line, No. 9 may ring No. 10 so that only the latter will hear it, the bells on all the remaining instruments remaining silent. The same may be done in the opposite direction so that No. 10 will not hear the ring.

The S-R system, it is said, gives the subscribers on the line intercommunicating service at all times, so they can call each other directly without first ringing "central." This is to overcome the lack of service during the night when the central office often is closed. Subscribers are never locked out completely. No matter how many conversations are going on over the wire, they can always



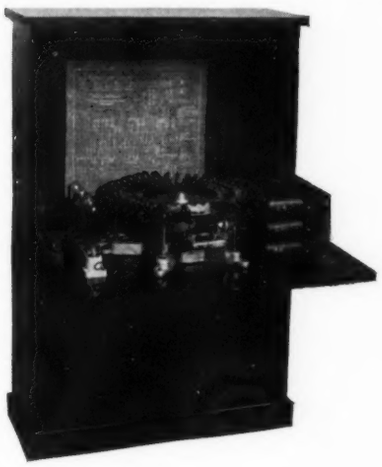
Method of Looping in Line Wire on Metallic Circuit.—On Grounded Circuit Line Wire Is Looped in as Shown by Lower Wire.

Fire Loss

$126,288,400!

The above figures represent the appalling fire losses for only the first nine months of this year. Unless fire is instantly suppressed at its origin, serious consequences are unpreventable.

Over 85 per cent of present fire alarm calls, according to reliable statistics, are sent over telephone lines, and about 90 per cent of all fire trouble starts at night.



—the telephone company is the "logical" center to provide the fire service of the Rotary Automatic Fire Alarm

The telephone company is the logical place to originate a fire call, in small or large cities, because it has the facilities to summon assistance. The telephone company, as experience has proved, can issue the call almost as soon as fire is reported, and can have the "fire fighting forces" on the job long before any serious headway can be made.

The ROTARY AUTOMATIC FIRE ALARM which has been endorsed by numerous state Firemen's Associations, by Fire Departments, by officials of municipalities and which is now used by many telephone companies, is the **best fire alarm system yet devised.** Can be added to any telephone system without affecting the normal operation and makes use of existing circuits. Can operate on any number of lines and its cost of installation is **50 to 75 per cent less than** that of other apparatus.

A "profitable" By-Product—adds prestige to telephone service—increases subscribers—and its service will be eagerly sought by Fire Departments, Factories, Hotels, Schools, etc.

Reduces Insurance Rates. Sure—Dependable—Instantaneous.

Visit Our Exhibit
Hotel La Salle
Room 1726
National Convention
December 8, 9, 10

Literature and particulars will be sent upon request. Make it your business to attend our exhibit. Room 1726.

Volunteer Firemen Signal Co.

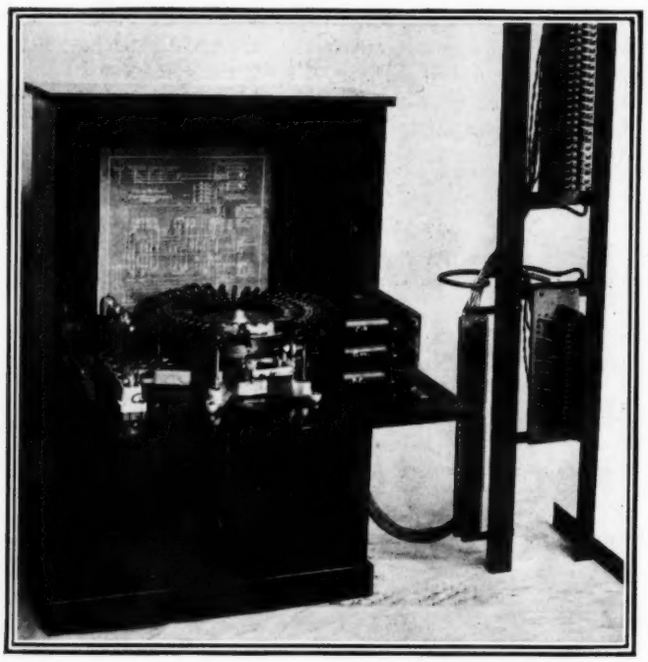
119 Fifth Street, S. E. **Minneapolis, Minn.**

ring, either to their neighbors or to the central office, whether the line is in use or not.

It is stated that the S-R system has been installed and is now being used upon rural lines by a number of telephone companies in Illinois and in other states. Communications for further information should be addressed to the S-R Electric Co., 30 N. LaSalle street, Chicago.

Automatic Apparatus for Sounding Fire Alarms.

The Rotary automatic fire alarm, which will be exhibited at the joint national convention in Chicago next week, is



Interior View of Rotary Fire Alarm Apparatus.

designed for use in towns having volunteer fire departments for hotels, large factories or buildings, for simultaneously notifying firemen, or all departments in a building of the breaking out of a fire.

The Rotary fire alarm uses the telephone circuits and telephone bells for fire alarm purposes, thus giving individual alarms to every point independently. The motive power is furnished by a powerful spring motor. The apparatus is set in operation by turing a key located at the switchboard or at some convenient place in the operating room, if desired. By this simple operation, the alarms are automatically sent out and the operator can return to her duties—the apparatus does the rest of the work.

The source of ringing current is automatically furnished the machine, regardless of the fact that the power machine at the time the alarm is turned in may be stopped. It is automatically started by the starting of the machine. A complete alarm consists of five intermittent successive rings on each bell, transmitted selectively and effectively over 40 lines in one minute. The machine stops when the sounding of the alarm is completed, and the operator is automatically notified that the machine has done its work.

The principles employed, it is said, overcome the objections that have been made relative to a fire alarm service in conjunction with a telephone system. The chance for trouble is said to have been reduced to practically naught and the factor of maintenance almost entirely eliminated.

The mechanism of the Rotary automatic fire alarm consists of a spring-driven motor with a large spring drum, upon which is mounted a detail of five insulated rollers. A trip releases this drum, allowing it to revolve while the insulated rollers pass under and engage lever springs which are connected in series with the telephone lines by means of cable and cross connecting wire at the exchange main frame. As the rollers engage the lever springs, the circuit of the telephone line toward the switchboard is broken and ringing current is sent directly out on a subscriber's line ringing his bell. Ringing current is sent out simultaneously over five lines as the drum revolves and the rollers pass from one spring to another.

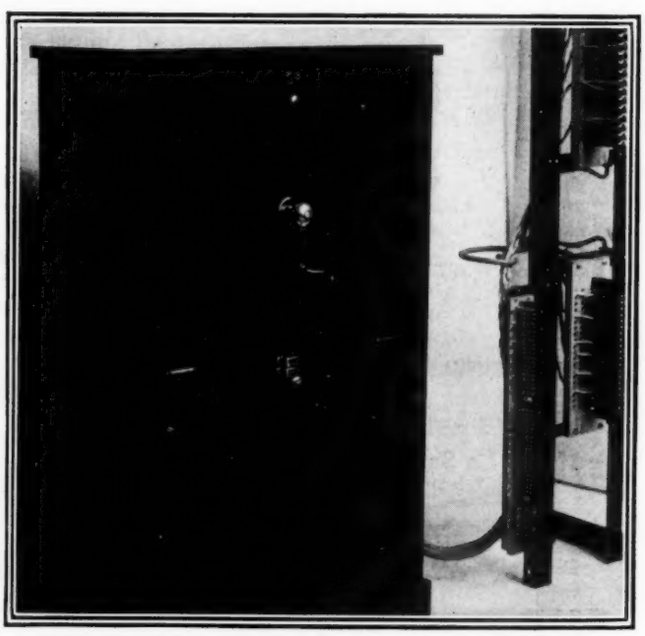
By means of this system, the bells on 40 telephone lines may be rung in one minute and during one complete revolution of the drum, each telephone bell is rung five successive times. If it is desired the drum may be started on another rotation, sounding the alarm five more times on each bell.

The contact springs are made of heavy German silver with platinum contacts and are so grouped that the lever spring furnishes a maximum amount of pressure to the contacts.

Inasmuch as the equipment is not connected to the telephone line, except when an alarm is sent in and the drum started to revolve, at which time the switchboard is disconnected, there is, it is claimed, no likelihood of interference with the normal telephone system, nor would its installation tend to increase the regular maintenance of the telephone system.

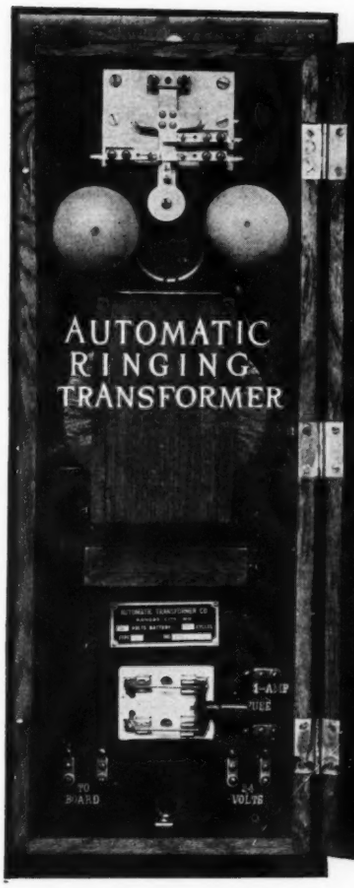
This Rotary automatic fire alarm has been strongly endorsed by the North Dakota Telephone Association, the North Dakota Volunteer Firemen's Association, and the Nebraska Firemen's Association. The chiefs of the fire departments in the places wherever this alarm equipment has been installed are said to be unanimous in their praise of it. It is stated that they all recommend the Rotary alarm as being the most efficient fire alarm that has ever been installed in small towns and agree that it has been the means of reducing the fire loss.

The manufacturer of the alarm states that, according to reliable information, there has been a gain of from three to fifteen subscribers in the exchanges where the machines have been installed, which is claimed to be directly due to its installation. The cost of installing the



The Rotary Fire Alarm Board Connected to Main Frame.

Rotary system is stated to be from 50 to 75 per cent. less than that of any other fire alarm system, while the natural maintenance of the telephone system maintains the machine and practically eliminates further cost of operating the apparatus. The fact that it is operated in connection



Do You Pay Cents or Dollars for Ringing Power?

Dispense with High Battery Expense

Declare Your Independence from Dry Cells at Famine Prices!

Dry batteries having advanced to almost a quarter of a dollar per cell, ringing power for your "Pole Changer" is costing approximately $9.00 per kilowatt hour or nearly 100 times the usual cost of commercial lighting current.

Not only is this a CRIMINAL WASTE but the efficiency of your ringing is far from what it should be, and from what you and your patrons deserve.

Batteries will be higher before they are lower and your pole changer will soon need a new set. DON'T RENEW THEM but install instead a $14 Storage Battery and a Type S Ringing Set and so get away from this dry battery expense and nuisance for all time.

This is too good a proposition to pass by. WHAT ARE YOU GOING TO DO ABOUT IT?

THE AUTOMATIC TRANSFORMER CO.

Ringing Equipment Specialists

407 Broadway, Kansas City, Mo.

Artificial Cable For Transmission Testing

Room 1734—Convention

Standard 32 Mile Artificial Cable

One of the many testing instruments you ought to know.

Thompson-Levering Company
Electrical Measuring Instruments
Philadelphia, Pa., U. S. A.

Grinnell REZISTOL Leather Work Gloves

are a great protection against electric currents

This leather, subjected to a "high voltage, break-down test" did not puncture below 4,000 volts.

Outwear two to three pairs of other gloves

Guaranteed not to harden, peel or crack from service. Unharmed by wetting. You can wash them, when soiled, in soap and water or gasoline. Dry out like new. You'll save money in the end, as well as have constant protection against injury, if you wear **Rezistol Gloves.**

Pair Free Ask your dealer for **Rezistol** gloves — a new glove of the famous Grinnell line. If he doesn't handle Grinnell gloves, write us his name and your size. With his first order for our 4-dozen assortment we'll include a pair for you **Free.**

Folder telling all about **Rezistol** *gloves, prices and samples of leather, with report of testing engineer, sent on request. Test the leather yourself.*

Mórrison-Ricker Mfg. Co.
133 Broad Street
Grinnell, Iowa

Style 4315 P. R. F.

with telephone lines is said to make it the best maintained piece of fire alarm apparatus in existence, as the telephone lines connected to the equipment are in use every day for the transaction of business.

The Rotary automatic fire alarm, it is contended, is an excellent by-product for a telephone company, as the company may provide the equipment and sell the service to hotels, factories, municipalities, etc., or the apparatus may be sold outright and then operated by the company at a nominal charge, in connection with its equipment.

The accompanying illustrations show open and closed views of the switchboard containing the Rotary automatic apparatus. The revolving drum with its rollers and the contact springs are clearly shown. The connection with the main frame is also plainly seen.

The equipment, as previously stated, will be exhibited at the joint national convention next week at Hotel La Salle, Chicago. It is manufactured by the Volunteer Firemen Signal Co., of Minneapolis, Minn.

The Adsit Company and War Orders.

The rampant war god of Europe reached out with his gory hand this week and riled the placid waters of the telephone trade.

The blow fell on the Adsit General Electric Co., of Minneapolis, Minn., manufacturer of the Adsit telephone lockout, when diverse persons, including A. Mullhousen, E. A. Mayer and H. N. Falk, all stockholders of the Adsit company, acting as representatives of a number of other pro-German stockholders, prayed the District Court of Hennepin County, Minnesota, for an injunction restraining the Adsit General Electric Co.

from selling or negotiating the sale of the Adsit product to diverse persons, doing business under the name of J. B. Saunders & Co., Ltd., of London, Cardiff, Swindon, Walshpool, Barrow-In-Furness and Liverpool, England, said firm being generally known as "Contractors to the War Office," "The Admiralty" and "His Majesty's Board of Works," of England, and it having come to the knowledge of the plaintiffs that such negotiations were predicated on the intended sale and delivery to said J. B. Saunders & Co., Ltd., of England, by the Adsit General Electric Co., of Minneapolis, Minnesota, U. S. A., of a quantity of Adsit company's machines, known as lockout instruments, composed of upwards of some 100,000 machines and that said machines are to be delivered to the army and navy and war forces of the English nation, and its allies, for the purpose of furthering the progress of the present war, by facilitating secret orders and secret communications, by telephones between army headquarters and advanced outposts.

And whereas, such use of said machines could only result in a perpetuation of, and a further increase in, the revolting carnage and bloodshed, at which the whole civilized world now stands aghast and, further, in view of the fact that the acceptance and filling of such orders would also exceed the company's charter rights, we, the above named stockholders, hereby, severally and collectively, pray this court to enjoin the Adsit General Electric Co., its officers and board of directors, and one Thos. W. Hicks, its general manager, from further negotiating such sale of said instruments to be used for such purposes as outlined herein, etc., etc.

"The serving of the injunction was like a bolt from the blue to the officers of the company," said Thos. W. Hicks, the manager, when interviewed regarding the matter.

"It is true that we have been negotiating with several foreign countries the past few months for the sale of lockout attachments. It does not necessarily follow, however, that these attachments are to be used wholly for war purposes and the company certainly does not admit having an order of any such proportions as intimated in the complaint. We have had some little correspondence with the Saunders people and we regard them as the most liable house to act as our foreign representative when we are ready to invade the English markets. Personally I have not read the complaint in full, but I think the parties in acting were hasty and not in full possession of the facts. It might be worth something to know that one or two of the plaintiffs in the complaint are known to have relatives, who are officers in the German army, and their views regarding the shipping of apparatus of any nature usable for war purposes to England and her allies might not be entirely without prejudice.

We admit that J. B. Saunders & Co. are contractors to the war office. But they also deal with private firms, and it is just as possible that any machines they have ordered from us, or might in the future order from us, would be used entirely for peaceful purposes. The only evidence to the contrary is to the effect that the extended outposts of the British army are all connected by telephone to the headquarters of the general staff. These outpost telephones for obvious reasons are connected in multiple, or in other words, the same as an ordinary party line. There have been numerous instances where the enemy has invaded these outposts and stifled the guard before any outcry could be made, and has 'listened in' on the line, received advance notice of an intended charge, and so informed the enemy, which immediately prepared to receive the charge at the point designated, resulting in a practical annihilation of the attacking party.

Our correspondence also shows that in one case where a German officer 'tapped' a British field telephone line and directed for several hours the concentrated fire of the allies' heavy artillery on to a space where (of course) the German army was not. It is true these conditions would be overcome by the use of the lockout, but this fact does not necessarily mean that any present business pending with foreign countries is wholly or in part for war purposes."

Franklin W. Adsit, the inventor and vice-president of the company, said: "The business end of the organization is in other hands, but if we have received an order for 100,000 lockouts from the allies, or from anyone else, I think the order should be filled. I think it is all right from every viewpoint to accept such business, and I presume the attorneys representing this company will endeavor to find a way whereby we can proceed in a perfectly legal way."

The date of the hearing to give the Adsit company an opportunity to show why the restraining order should not be made permanent has not been set, but the case will undoubtedly be watched with close interest by the telephone trade in general.

Book Review.

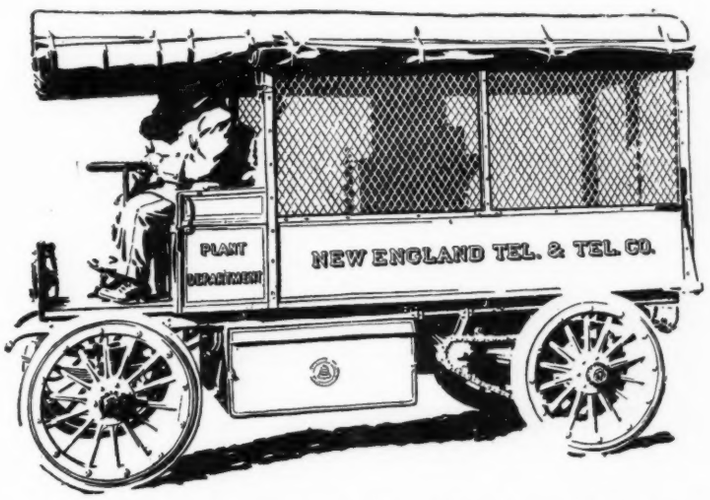
SECRETS OF SERVICE ON RURAL TELEPHONE SYSTEMS, by H. N. Faris, 540 Freeman avenue, Kansas City, Kan. Published by the author, 36 pages, 7¾ by 10 inches, with illustrations. Price $1.

This book which is published in bulletin form, contains a large amount of condensed and intensely practical information relative to service improvement on run-down rural systems and just how to go about it to get results, even when the available capital is limited. What manager in his telephone expereince has not wondered at the freedom with which individuals in prosperous rural communities spend their money for the various conveniences, and even the luxuries of modern living, but how niggardly these same people are when it comes to a small expenditure to secure better and more efficient telephone service.

The past decade or two has witnessed marked improvements in farming methods and a general increase in efficiency, both on farms and in smaller towns. Such increased efficiency not only pays in financial returns, but has so improved and beautified living conditions that in the more

Telephone Efficiency

It's going to be worth your trip to the convention in Chicago to see and hear about our six models. G. V. Electrics are used by more Public Utility Companies than any others, regardless of type. No less than 1,117 are used by 25 firms.



(1-ton G. V. Electric. Speed 12 miles. Mileage 45-60 per charge.)

G. V. Electric Trucks

are built by the oldest and strongest company of its kind in the world. Nearly 5,000 in use, many 7 to 15 years old.

Be sure to call at our office. We have some interesting literature and we want to show you the advantages of a G. V. Electric Truck in your telephone work.

Catalogue 114 is handsomely illustrated.

General Vehicle Company, Inc.
Long Island City, N. Y.
New York, Chicago, Boston, Philadelphia

Chicago Office: **10 South La Salle Street**

prosperous sections everything smacks of efficiency except the shiftless appearing, tumble-down telephone lines which are too often the rule rather than the exception. Though such lines are usually controlled by a board of directors representing the leading merchants and business farmers of the community, such boards are too frequently over anxious to operate at the lowest possible cost, and expect employes to furnish good service with run-down lines and without proper equipment.

The avowed purpose of this book is to afford such practical information as will enable the managers of small exchanges to give their directors maximum returns for all money spent in maintenance and improvement, and to impress upon the minds of the directors themselves the need of better and more substantial construction and to show them how their construction can be brought up to standard gradually by merely doing necessary maintenance work in a permanent manner and with proper materials.

The Treco Magnet Charger.

The permanent magnets in a telephone set, which include generator magnets, ringer magnets and receiver magnets, should always be kept fully magnetized or the telephone will not work at its full efficiency.

Weak generator magnets result in imperfect signaling, especially on country lines. Distant subscribers on heavily loaded lines are often unable to ring intermediate subscribers or "central," and have to call on other subscribers to ring for them. Weak ringer magnets also result in indistinct or imperfect bell signaling. Instead of a sharp, clear ring, only a light tap of the bell is heard. Weak receiver magnets are sometimes the cause for, "Talk louder, I cannot hear you."

These troubles, due to weak magnets, can be overcome by keeping the magnets charged to their full saturation point.

The Treco magnet charger, for which a patent is pending, is designed to operate from an ordinary six-volt storage battery, four or five dry cells or from a 110-volt direct current circuit, sources of power to be found in every telephone exchange. The charger is simple to operate, its manufacturer contends, it containing no condensers, rectifiers, etc.

The Treco magnet charger consists of a magnetizer and a Norway iron base, together with a switch, polarity indicator and attachments for re-magnetizing ringer and receiver magnets.

It is stated that with the Treco magnet charger, three or four applications of one second each of the current, on each leg of the magnet, is all that is necessary to bring any magnet up to its maximum strength.

Treco magnet chargers are made in two sizes: No. 1 for telephone exchanges and No. 2 for automobile, motorcycle, motorboat, as well as traction and stationary gas engines. The No. 2 size includes attachments for charging Ford magnets without taking them from the flywheel.

The charging of automobile, motorcycle, motorboat, traction engine and stationary gas engine magneto magnets is said to be a profitable source of revenue for telephone exchange managers, as they are usually better qualified to do this work than the average automobile mechanic. The average price paid for this class of work, it is stated, is 50 cents to $1 per magnet, or $2 to $6 for each magneto, while the cost of operation is claimed to be less than two cents for each full set of magnets.

The Townsan-Remington Electric Co., Ft. Worth, Tex., the manufacturer of this magnetizing device, will be glad to furnish further information to those interested.

Use of the Telephone in Show Window Demonstrations.

Further information relative to the telephone apparatus for use in show window demonstrations, which was illustrated in TELEPHONY of November 20, has been supplied by the Automatic Enunciator Co., of Chicago, the manufacturer. The apparatus used in connection with the dem-

Simplex Jacks

No. 318 POLE JACK

Especially designed for use in pulling, reinforcing and straightening telephone poles.

Extracts the pole in upright position; as the pole inclines, the jack pivots on its base and follows the pole at the same angle.

A PERMANENT ASSET
to Every Company

The amount saved by reinforcing, setting, straightening or pulling a few poles offsets the initial cost. No preliminary digging—winter or summer, in any soil it does the trick.

"Quality in tools never caused a failure or regret"

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A New Record

8 MINUTES each was the time required to pull large butt poles, embedded in over SEVEN feet of CLAY soil—in a recent test made by the Commonwealth Edison Co. of Chicago.

What Is Your Present Pole Pulling Cost?

Bulletin 215 on request.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

Fleet of White 1½-ton trucks owned by The Cleveland Telephone Company

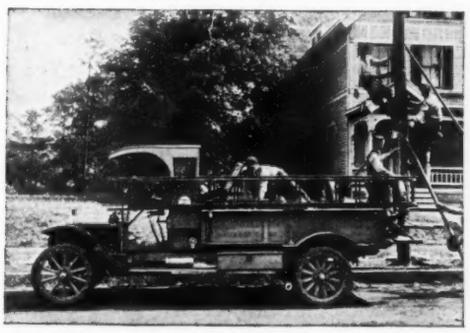
WHITE TRUCKS
In Telephone Service

MANY telephone companies are rapidly standardizing their truck equipment with White Trucks. These sales in the telephone field have increased with steady precision till now 23 different telephone companies are operating a total of 89 White Trucks.

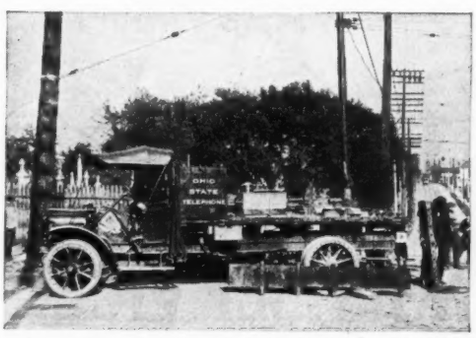
Special body types have been designed to meet the various demands of telephone service—these are illustrated in a new booklet concerning White Trucks in service in the telephone field. Send for a copy.

THE WHITE COMPANY
Cleveland

See our exhibit at the Convention. Mr. F. H. Williams will be in charge and will gladly furnish any information desired.



White 1½-ton truck owned by The Southern New England Telephone Company



White 3-ton truck with power winch owned by the Ohio State Telephone Company

White 5-ton truck owned by the Bell Telephone Company of Pennsylvania

stration was invented by J. J. Comer. The demonstrator speaks into a transmitter which is connected with a strong magnetic receiver or reproducer on the outside of the window. The reproducer is fitted with a large horn which acts to reflect sounds from the reproducer out into the air.

In the operation of the equipment, direct current only is used. If alternating current were introduced, the only sound which could be heard would be one which is somewhere near the frequency of the alternating voltage.

The Garford Exhibit at Joint National Convention.

The Garford Mfg. Co., of Elyria, Ohio, will be located in Rooms 1712 and 1713, at Hotel La Salle, next week during the joint convention of the two national associations, with a complete exhibit of common battery and magneto equipment.

A New Grinnell Glove.

Glove satisfaction is only secured where the best glove for the purpose is used. A dress glove, for example, would not be at all suitable for a brick layer to use in handling wet bricks; but for the man in evening dress they are highly satisfactory, and preferred to the work glove.

The thresherman's work is just as important as the railroad engineer's, and requires the same amount of skill. The railroad engineer is very particular about the gloves he wears, and the thresherman should be likewise.

Morrison-Ricker Mfg. Co., of Grinnell, Iowa, maker of the well known Grinnell gloves, has a special glove for the thresherman which, it is said, is a favorite among those who have used it. While it is extremely serviceable and fits the hand perfectly, it is contended that there is barehanded freedom which allows the adjusting of the engine or thresher to be done without removing the gloves. Another point in favor of these gloves, the manufacturer states, is that the user does not have to worry about soiling them, as the grease and dirt roll out of the gloves when washed in soap and water or gasoline and dry out soft and fluffy as when new.

Telephone men will also find these gloves particularly useful in trouble and other work. A copy of the new Grinnell catalog will be sent, upon request, to any company desiring it.

Electric Winch for Setting Poles.

A winch-equipped, General Vehicle, two-ton truck in service in Boston is used by the maintenance of lines department of the public utility company, to transport poles up to 50 feet in length from the pole storage yards, and to hoist them into position.

A small two-wheel dolly is used to support one end of the pole, the other end being chained to the truck. The body of the truck is used as a traveling stockroom carrying line material, tools, etc.

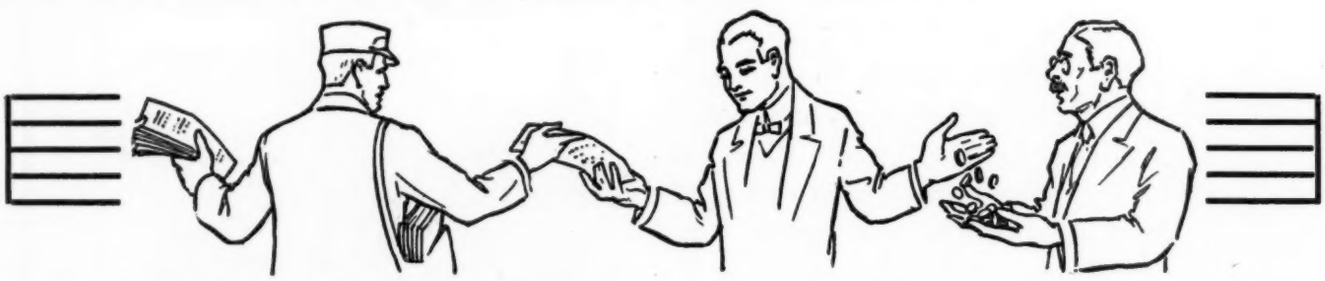
Paragraphs.

THE RELAY AUTOMATIC TELEPHONE CO., LTD., of London, England, will have an exhibit of its relay automatic system, which was described in TELEPHONY some time ago, at the joint convention of the National Independent Telephone Association and the Independent Telephone Association of America at Hotel LaSalle next week.

THE WASHINGTON TELEPHONE CO., of Washington, Iowa, has ordered 1,500 subscribers' sets from the Garford Mfg. Co., Elyria, Ohio, instead of 900 as was previously announced.

December Issue of Gar-Facts.

Gar-Facts, the newsy house organ, published by the Garford Mfg. Co., of Elyria, Ohio, is out for December. Among other things, it contains interesting information regarding recent patent decisions. If you are not already on the mailing list for Gar-Facts, send your name and address to the Garford Mfg. Co.



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